DEPARTMENT OF AGRICULTURE

BRITISH EAST AFRICA.

IMPERIAL BUREAU OF MYCOLOGY
27 JUN. 1921

ANNUAL REPORT,

1915-1916.

PRINTED AT
THE "LEADER," NAIROBI AND MOMBASA.

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ANNUAL REPORT

OF THE

AGRICULTURAL DEPARTMENT.

FOR THE YEAR, 1915-16.

DEPARTMENT OF AGRICULTURE,
NAIROBI, BRITISH EAST AFRICA,
MAY, 1916.

HIS EXCELLENCY THE GOVERNOR,
Nairobi.

YOUR EXCELLENCY,

I have honour to submit herewith my report of the Agricultural Department for the year ending 31st March, 1916, together with the reports of the Chiefs of the various Divisions of the Department.

Owing to the absence on military duty of the Entomologist and the Plant Import Inspector, their reports are not included.

This has again been a year of war on our borders and consequently the advancement which Agricultural Industries would doubtless have made under happier conditions has been much curtailed.

It cannot, however, be said that Agriculture has made any retrogade movement, but rather the contrary.

During the absence on military duty of many Government Agricultural Experts, Settlers and Planters, it has been a matter of great difficulty to carry on the agricultural work of the country. Every effort to look after the interests of those away at the front has however, been made by those remaining on the land; and I am glad to say that the result has been on the whole satisfactory.

Stock. The necessary supplies for the large numbers of His Majesty's Troops present in the Protectorate have caused a heavy demand on the resources of stock owners, both Native and European, which has been met in an admirable manner.

The following particulars of live stock consumed by the Military from the commencement of the War to March 31st, 1916, speak for themselves:—

Cattle	35,434,
Sheep	128,123,
Goats	16,327.

It must be remembered that these figures do not include civil consumption, nor the numerous deaths occasioned by movement under abnormal conditions ; and an additional 20,000 cattle have been used up for transport purposes.

This extraordinary consumption has naturally resulted in a certain shortage of beef and mutton animals available at the present time, and a consequent rise in retail prices.

The increased cost of meat to the public, must I fear, be expected to continue for a considerable period after normal conditions obtain once more.

The desire for pure bred and high grade stock was again shown at the Annual Government Sale at Naivasha.

Owing to the supply not being equal to the demand, keen bidding resulted and record prices were obtained.

The health of stock during the year has on the whole been good. A notable exception has been the large number of cases of Trypanosomiasis in the Thika district. A pamphlet by the Veterinary Pathologist giving an account of this outbreak has been published.

Crops.—The principal crops of the country generally speaking, again did well, though the short rains in certain districts were insufficient for such crops as maize and beans.

The area under coffee has increased considerably. The present acreage approximating 16,000 acres. The leaf disease Hemeleia Vastatrix has done only a moderate amount of damage : the trees if properly treated in time recover rapidly.

A new " thrips " has however appeared and seriously injured the trees of certain planters, especially in the Kyambu district.

The Department has sent a number of trial consignments of coffee berries to test the South African market Full particulars of sales are not yet to hand, but present information shows that there is a ready and profitable market for this product in the South.

The interests in Sisal and Flax have grown considerably greater during the year, and a number of extra machinery plants have been erected and a large number are on order from home.

No further progress has been made regarding the erection of of a factory for the extraction of tannin from green wattle bark. The Department is however, conducting enquiries in other wattle producing countries, and the resulting information will be placed before those interested at an early date.

Owing to War conditions it was not considered advisable to put into force the legislation framed on the report of the Cocoanut Commission, but the trap system for the collection and destruction Rhino beetle has been continued and extended with very satisfactory of the results.

Abnormal rains in the Lamu District caused serious damage in some of the Coco-nut Plantations.

A large number of Settlers continue planting citrus orchards, especially limes and lemons with the object of subsequent export of lime juice and citrate of lime, and factories for this purpose will shortly be built. The supply of budded stocks from the Government Farm, Kabete, does not meet the demand while imported trees are somewhat expensive and a good opportunity therefore, appears to offer for the establishment of nurseries.

Trials with sugar canes imported from various sugar producing countries have been most successful, and it seems almost certain that this will become a flourishing and profitable Industry in the near future.

During the latter part of the year under review large swarms of locusts made their appearance in the Protectorate, but arrangements have been made by the Department to deal with the pest when the young hatch out.

Staff.—The following members of the Staff who had proceeded on leave during the previous year returned on the dates stated:—

	Date of Departure.	Date of Return.
Mr. L. D. Carpenter...	23rd October, 1914...	16th July, 1915.
„ W. McNaughton	5th Jan., 1915 ...	31st August, 1915.
A.C. MacDonald.	4th March, 1915 ...	22nd June, 1915.

The undermentioned Officers proceeded on leave during the year:—

	Date of Departure.	Date of Return.
Mr. H. B. Simson...	15th April, 1915 ...	1st Nov., 1915.
„ J. D. Ritchie.	„ „ „ ...	„ „ „
„ J. B. Dopwell.	30th April, 1915 ...	„ „ „
„ T.J. Anderson.	27th June, 1915 ...	12th Nov., 1915.

Three Officers were seconded to other departments for the periods stated:—

Mr. C. J. Monson to the Department of Registration of Documents and Crown Lands as Registrar of Crown Lands and Documents, Nairobi, 25th October, 1915, to 17th January 1916.

Mr. W. J. Dowson to the Post and Telegraphs Department, 15th November, 1915, to 31st January, 1916.

Mr. H. B. Sharpe to the Forestry Department, 24th November, 1915, to 8th February, 1916.

Six Officers joined His Majesty's Military forces, *viz*:—

Mr. W. J. Johnson joined R.E.Z. Signal Co., 13th Oct., '15.

„ L. D. Carpenter joined E.A. Pioneers 15th October, '15,

„ J. D. Ritchie joined E.A. Pioneers 8th November, 1915.

„ H. B. Simson joined R.E.Z. Signal Company as Despatch Rider 11th November, 1915.

„ R. R. Dedonckele joined the E.A.M.R. 23rd November, 1915, killed in action 19th January, 1916.

„ T. J. Anderson joined the E.A.V.C. 4th January, 1916.

METEOROLOGICAL.

The necessary temporary abandonment of certain stations owing to the absence of the observers has caused the records to be somewhat curtailed.

Rainfall records for 1915-16 are appended.

(Sd.) A. C. MACDONALD,
Director of Agriculture.

RAINFALL RECORDS BRITISH EAST AFRICA, 1915.

Reg. No.	Station.	Observers.	Jan.	Feb	Mar.	Apl.	May	June	July	Aug.	Sept	Oct.	Nov.	Dec.	Total	Remarks.
1	Alexandria	D. C. Gosha	0·00	0·00	1·20	1·40	3 80	1·06	1·80	0·00	0 00	2·70	5·81	0·20	17·97	
2	Athi River	Kenani, Fibre Lands ...	0·59	0·08	4·66	4·11	3·16	1·07	0·00	0·58	0·58	0 50	4·76	0·83	20·92	
3	Athi River	Station, U. Rly.	0·00	0·46	2·85	6·83	1·50	0·20	0·00	0·00	0.81	1·40	3·33	0·69	18·07	
4	Butere (Marama) ...	A. G. Leech	1·88	3·12	7·18	8·47	10·29	5 62	4·96	2·01	...	...	...	...	43·53	8 months.
5	Kabarnet	Asst. Dist. Comr. ...	0·00	0·03	7·35	7.23	12·57	18·16	5 55	2·68	1·42	1·45	4·80	2 17	63·41	
7	Chania Bridge	R G. Henderson ...	0·09	0·00	3·09	8·43	2·99	2·50	0·75	0·05	1·38	3·40	4·81	1·08	28·57	
6	Chania Bridge	A. R. Cunningham ...	0·00	0 00	2·87	11·47	3·26	...	...	...	...	...	...	...	17·60	5 ,,
173	Chania Bridge	J. W. L. Focks	...	0·00	5·04	8·12	0·98	1·52	0 40	0·03	2·31	3·49	5·44	0·69	28·02	11 ,,
8	Chuka	Dist. Comr.	0·35	0·0	6·03	17·22	3·24	1 48	1·21	0·41	0·64	8 28	13 58	4·19	56·63	
9	Dagoretti	Forest Sation	0·26	0·95	2·23	6·98	4·73	2·39	0·00	0·08	1·79	2 19	5·00	1·13	27·73	
163	Engirende	O. C. Masai Reserve ...	0·00	5·03	8·61	5·32	3·14	3·62	0 32	0·99	0·82	1·81	1·69	2·79	34·14	
10	Escarpment	Forest Station	0·08	0·19	3 83	9·08	8·65	3·54	0·11	0 46	0·89	2·24	3·64	1·98	34·69	
11	Eldama Ravine ...	Dist. Comr	0·17	0·13	7·10	4·98	6·56	10·16	4·06	2·72	0·86	1·92	3·41	1·42	43·49	
12	Elementeita ...	R. Chamberlain	0·00	0·02	4·21	4·35	3·65	2·57	1·29	5 90	1·49	2·73	1·94	1·00	29·19	
13	Embu	Dist. Comr.	0.00	0·00	4·99	8·99	9·54	3·04	0·98	0·35	0·56	4·07	10 43	0·00	42·95	
15	Fort Hall	,, ,, ...	0·07	0·00	8 86	11·35	9·77	1·52	0·72	0 00	1·53	6·71	8·70	2·33	51·56	
17	Fort Ternan	Ross Bros.	...	1·93	6.64	9·59	5·84	7 99	1·60	2·79	2·57	3 70	3·00	1·97	47·62	11 ,,
19	Gazi, Kinondo	East African Estates ...	0·18	0·00	4·50	3·12	20·50	11 86	...	. .	...	...	...	...	40·16	6 ,,
21	Gilgil	E. C. Anderton, Colulles Farm.	...	...	...	...	...	7·72	3·00	3 62	2 74	1·90	3·47	0.82	23·27	7 ,,
22	Gyriama	Nyika District, A.D.C. ...	0·00	0·00	0·00	0 00	4·57	7 11	...	0·98	2·08	...	...	...	14·74	8 ,,
157	Gowben	Halwallood, C. M. Gabriel	0·00	0·00	0·27	0·00	6·71	7·35	2 15	0·00	0·00	0·00	0·00	0·00	16·48	
14	Kilindini	Station. U. Rly.	0·29	0 00	3·33	6 72	18·07	12·14	3·56	1·40	3·51	2 97	1 58	2·33	55·90	
18	Kenani	,, ,, ...	0·00	1·12	1·06	1·92	0·46	0·00	0·00	0·00	0 00	...	4·75	8·10	17·41	11 ,,
27	Kabete Farm	Kikuyu, Manager ...	0·05	2·23	3 54	8·85	6·46	5 28	0·14	0 04	2·03	0 31	7·90	0 38	37·21	
26	Kabete Laboratory ...	,, Vety. Pathologist ...	...	...	...	...	...	4 03	0·00	0·00	1·72	1 39	6·81	0·91	14·86	7 ,,
25	Kaimosi	Mission	0 23	2·42	8·23	7·00	7·78	9 14	1·22	7·46	5·63	6·96	6 82	3·81	66·70	
31	Karura	Forest Station	0·00	0 33	3·52	10·63	3·49	2·55	...	0 59	1·11	...	5·34	0·68	28·24	10 ,,
35	Kericho	Dist. Comr.	3·04	0·18	10·73	7 15	11·90	12 25	7·19	6 29	4·83	7·10	5·89	3·45	80·00	
34	Ker cho	Lumbwa Iudustrial Mission	3·53	0·33	14·09	7·10	12·34	11 63	3·45	7 85	6·41	6·41	3·95	3·78	80·87	
33	Ker cho	Orchardson Bros. ...	3 33	0 28	12 4	7·05	12·03	10·04	4 77	6·75	5 78	8·67	3·86	2·95	77·94	
45	Kibos	Government Farm... ...	2·75	1·27	3·58	6 86	5·83	8·69	1 02	2 89	3 69	4 71	3·50	4·44	49·23	
28	Kakamega	R. C. Mission	0·46	0·45	6·81	12·31	9·61	11·20	4·95	6·24	4·26	8·30	5·89	6·63	77·11	
46	Kikuyu	C. of S. Mission ...	0·45	0·95	4·31	9·78	5·38	2·74	0·00	1·85	2·52	2·52	5·91	0·35	36·76	
39	Kinangop	Forester	0.19	1.22	2·76	10·32	4·42	6·05	1·08	2·19	2·37	3·66	1·75	1·62	37·63	
43	Kipini	Dist. Comr.	0·00	0·00	1·56	3·86	18·76	8·82	2.84	0·00	0·98	0·00	5·79	3·52	46·13	

RAINFALL RECORDS, BRITISH EAST AFRICA 1915—(*Continued*)

Reg. No.	Station.	Observers.	Jan.	Feb.	Mar.	Apl.	May	June	July	Aug.	Sept	Oct.	Nov.	Dec.	TOTAL	Remarks.
44	Kisii	Dist. Comr.	1·02	1·52	7·79	13·46	9·24	8·34	5·81	3·23	7·25	6·19	6·57	6·34	76·76	
40	Kismayu	,, ,, ...	0·00	0·00	0·14	0·00	5·00	5·90	3·76	0·44	0·89	0·04	0·48	0·00	16·65	
47	Kisumu	Prov. Com.	2·46	0·68	6·79	7·28	6·47	8·14	0·18	1·94	3·13	3·34	3·07	3 39	46·87	
49	Kitui	Dist. Comr.	0·23	0·00	9 75	18·72	7·53	0·99	0·43	0·00	0·19	2·32	9·22	3·75	53.13	
50	Kiu	Station, U. Rly.	0·22	1·66	12·21	10·19	2·95	0·00	0·00	0·00	0·00	1·11	1·09	0·84	30 27	
36	Kyambu	Dist. Com.	0·01	0·53	2·82	9·16	8·75	5·77	0·19	0·17	1·87	4·38	6·60	1·24	41·49	
37	Kyambu, Karamaini ...	A. C. Harries	0·00	0·00	2·24	8·02	3·85	1·61	0·95	0·30	0·90	4·05	4·26	0·71	27·89	
30	Kyambu ...	Kamiti, Downs, Cullis Relly ...	0·00	0·76	3·02	8·41	3·06	2·22	0·45	0 30	1·45	2·79	9·19	0·98	32 63	
153	Kyambu	Kijambu, H. F. Wells ...	0·01	1·84	4·43	9·42	7·12	5·79	0·34	0·48	1·46	4·39	9·27	0·46	45 01	
29	Kwale	Forest Station	0 00	0·00	0·85	3·07	15·07	10·51	2·69	1·22	0·80	7·35	2 24	0·95	44·75	
24	Kyambu, Karumu ...	Kamunyu Syndicate ...	0·00	2·84	4·26	9·91	7·81	5·07	0·40	0·44	1·70	4·73	7·65	0·64	45 45	
52	Lamu	Dist. Comr.	0·00	0·00	0·12	2·04	21·60	10·72	2·03	0·00	1·67	0·00	3·77	1·06	43·01	
51	Lari	Forest Station	0·49	0·73	5·88	12.97	13·22	7·76	0·18	0·09	3·65	3·65	6·71	1·20	56·53	
53	Limoru, Caineville ...	W. H. Caine	0·32	1·37	4·97	11·89	16·91	5·58	0·43	0·25	1·60	3·44	6·53	0·50	53·79	
54	Limoru, Cloverdale ...	B. Conybeare	0·47	1·21	4·66	9·98	13 68	5·18	0·40	0·30	1·60	1·80	7 98	0 43	47·69	
55	Limoru, Hope Farm ...	A. D. Impey	0·06	1 45	4·15	11·78	9·41	4·70	0·30	0·16	2·16	4·79	7·82	0·67	47·45	
56	Londiani	Forest Station	0·63	0·47	6·42	5·50	3·02	6 01	1·32	3·13	0·72	2 01	1 72	1·98	32·93	
62	Londiani, Farm 1521 ...	J. J Drought	0·34	0·63	8·25	7·70	6·30	4·88	2·66	2·54	2·88	3·36	2·20	2·13	43·87	
60	Lumbwa	L. M. Joubert	...	...	...	...	...	7·55	3·25	7 41	..	...	...	...	18·21	3 months.
59	Lumbwa ...	Station, U Rly.	0 00	0·15	6·09	5 82	6·03	4·59	0·52	2·25	3·50	6·00	6·50	1·65	43·10	
152	Muhoroni, Koru ...	C. Harvey, Farm 1450 ...	3·61	2·15	6·80	5·70	6·85	7·09	2·12	1·42	7·28	3·25	5·46	4·31	56 04	
176	Molo	Equator Saw Mills	...	...	...	...	...	...	...	...	0·87	1·73	2 96	2·76	8·32	4 ,,
84	Magadi Junction ...	Station, U. Rly.	...	...	...	...	...	...	...	0·00	1·25	1·50	1·27	1·12	5·14	5 ,,
64	Machakos	Dist. Comr.	0·14	0·30	4·15	10·17	5 97	1·33	0·16	0·00	0·26	3·85	5·42	3·40	35·15	
65	Mackinnon Road ...	Station, U. Rly.	0·32	0·60	3·00	5·90	6·78	3·85	1·75	0·70	1.40	1·27	4·65	1·83	32·05	
66	Makindu	,, ,, ...	0·00	0·88	2·50	7·27	0·00	1·62	0·00	0·00	0·00	0·21	3·36	3 06	18·90	
67	Malindi	Dist. Comr.	0·00	0·00	3·86	3 86	14·95	11·15	4·08	0·85	0·64	1·39	5 38	0·00	46 16	
68	Mara River	O C. Masai Reserve ...	0·00	1·48	4·37	6·16	4·21	0·82	0·10	0·28	0·26	0.16	2·38	3·24	23 46	
162	Marakwet	Dist. Comr	0·00	0·17	10·35	12 49	7·51	3 86	2·07	1·93	3·50	5·70	7 77	2·41	57·76	
70	Maseno, Kisumu ...	E. A. Industries	0·48	4·53	4 68	9·08	7·24	4·45	3·08	6 47	7·54	5·26	6·05	7·18	66 04	
71	Masongaleni	Station, U. Rly.	0·30	0·10	1·78	5·73	1·03	0·10	0·12	0·00	0·00	0·90	3 93	4 80	18·79	
72	Mazeras	,, ,, ...	2·90	0 00	3 50	3·35	21·75	14.10	3·65	0·80	3·30	8 25	1·00	4·70	67 30	
90	Meru	Dist Comr.	0 10	0·00	6 50	12·87	11·21	0·26	0·26	0·24	2·80	5·39	13·14	4·60	57·37	
77	Molo, Over Haddon ...	Abraham Bros.	1·38	1·60	6·17	7·90	7·39	9·16	3 66	6·57	5·46	2·66	6·30	1·91	60·16	
78	Molo	Station U. Rly.	0 21	0·15	6·50	9·38	5·83	10·25	2 31	2·86	3·00	2·61	3·93	1·92	48·95	

RAINFALL RECORDS, BRITISH EAST AFRICA 1915—(*Continued*).

Reg. No.	Station.	Observers.	Jan.	Feb.	Mar.	Apl.	May	June	July	Aug.	Sept	Oct.	Nov.	Dec.	Total	Remarks.
76	Mombasa	Prov. Comr.	0·02	0·00	3·51	6·56	18·57	15·30	3 71	1·14	3 89	2·69	1·41	0·65	57·45	
73	Mombasa	Mto Panga Estates	0·10	0·00	2·18	11·36	25·03	24·49	3 96	1·28	4·60	1·18	1·82	0·00	76·00	
74	Mombasa	Mtwapa Estates	0·00	0·00	3·20	7·40	24·20	13·34	4·18	0 88	3.60	1·25	2·35	0·14	60·54	
75	Mombasa	Nyali Sisal Estates	0·21	0·00	3·75	6·47	20·84	13·37	4·92	1·38	3·28	1·24	0·46	0 30	56·22	
80	Mua Hills, Machakos ...	A. Milne	0·00	0·00	2·63	6.45	4·24	1·38	...	...	0·63	1 75	9·08	3·03	29·19	10 months.
82	Muhoroni	Capt. S. Charrington ...	1·07	1·96	7·82	6·91	9·05	9 98	3·65	2 52	5·49	2·33	6 44	1·93	59·15	
83	Muhoroni	Station, U. Rly.	3·22	1·38	5·03	8·99	3·87	5·47	3·07	9·38	7·90	14·03	14·20	20·70	97·24	
86	Muhoroni	B. F. Webb	3·05	2·20	6·60	7·91	7·40	4·38	0 97	2·68	5·88	4·54	3·00	5·81	54·42	
81	Mumias	Dist. Comr.	0·94	3·18	5·48	12·28	9·72	7·34	6·29	3·51	4·84	8·36	6·54	7·78	76·26	
175	Nandi Border	Elgon Estate, Ltd Uasin Gishu.	1·52	0·81	8·06	5·19	5·92	8·39	3·75	6·73	2·83	2 87	4·84	2·55	53·46	
91	Nairobi	Agriculture Dept.	0·03	0 54	2·58	11·19	3·26	1·26	0·00	0·02	1·10	...	...	...	19·98	9 months.
94	Nairobi	P. W. D.	0·00	0·32	2·98	10·88	2·71	1·06	0·00	0 15	0·84	2 47	3·96	0·32	25·69	
92	Nairobi	Station, U. Rly	0·05	0·46	1·68	10·70	3·04	1·45	0·00	0·10	0·47	2·35	4·77	0·62	25·69	
93	Nairobi Hill	T. A. Wood	0·01	0·64	2·62	11·41	3·67	1 78	0·04	0·04	0·97	2·51	4·38	0·81	28·88	
98	Naivasha	Rustenburg, J. Barry ...	0.00	0·10	3·11	3·92	1·87	3·36	0·00	0·45	0·95	0·67	1·07	0·49	15·99	
104	Naivasha, Njabini ...	Capt. Fey	0·55	0·29	9·43	9·67	9 52	7·41	1·65	2 25	3 05	2·71	3 29	1·02	50·84	
96	Naivasha	P. W. D.	0·07	0·06	1.14	4·93	2·48	1·83	0·42	0·77	0 80	1·76	2·60	1·18	18·04	
95	Naivasha St. U. Rly. ...	P. Way Inspector (thro) District E. Nakuru	0·05	0·40	1·20	6·26	2·35	1 41	0·40	0 93	0·55	0·95	3·70	2.00	20·20	
99	Nakuru	Dist. Comr.	0·44	0·45	6·02	5·86	5 77	4 07	0·88	2·68	2·18	1·33	1·73	1·94	33·35	
100	Nakuru St. U. Rly. ...	Dist. E. Nakuru	0·00	0·43	7·04	6 09	6·04	4 45	0·81	2·29	2·39	1·50	1.37	3·20	35·61	
103	Nandi	Abraham Bros.	0·75	2·03	7·57	6·06	8·81	7·77	4·95	4·12	4 63	4·80	4·54	3·43	59·46	
102	Nandi	Dist Comr	1·02	2 07	7·57	6 24	8·06	8 10	4·39	0·21	6·11	3·30	5·23	1·95	54·25	
174	N'di, St. U. Rly. ...	Voi Plantation Ltd.... ...	0 56	1·50	1·31	4·86	0·65	0·25	0·00	0 00	0·15	1·39	3·16	3·87	17·70	
107	Ngobotok, Turkana ...	Dist. Comr.	0·00	...	...	...	...	...	...	...	1·63	3·36	1·55	1·58	8·12	5 months.
108	Kgongo Bagas	Dist. Comr.	0 00	0·30	3·33	9·89	5·25	1 95	0·00	0·00	0 48	2·95	2·67	0·48	27·80	
109	Ngong	Swedo Africa Coffee Co. ...	0·00	0 86	2 69	11·47	4·70	2 28	0·00	0 22	1·79	3·90	3 40	0·48	31·79	
111	Njoro	D Fawcus	0·14	0·30	5·24	7·86	6·22	5·25	1·28	2 70	2 50	0·55	1·69	2·40	36·13	
105	Nyeri	Dist Comr.	0·18	0·69	2·31	6 07	9·94	2·23	0 75	0 44	1 06	2 05	2·74	1·70	30 16	
106	Nyeri, Tumu Tumu ...	Dr. Phelps	0 00	0 57	3·61	...	...	...	...	...	...	...	...	...	4·18	3 months.
172	Nyeri	C. O'Hagan	0·00	1.27	1·74	6·03	9·33	3 04	0·74	0 35	1 37	2·33	2 90	1·11	30 21	
114	Port Florence (Kisumu) ...	Station U. Rly.	2·16	0·26	6 01	6·69	5·35	8 24	0 00	0·75	3 50	3·58	2 67	3·59	42·80	
116	Rabai	Dist. Comr.	0·38	0 00	4·20	6 75	16 38	12 04	3 46	1 30	3·09	3·97	2 05	2·80	56·42	
117	Rongai River	A. Armstrong	0·00	0·10	4·05	7·37	4·72	5·22	2·41	2 33	1·57	2·44	1·43	0·90	32·54	
115	Ruiru, Power Stn. ...	Nairobi Electric Lt Co. ...	0·00	0·00	3·25	6·88	3·10	1·60	0·48	0 67	1·87	1·80	7·81	1·22	28·68	

RAINFALL RECORDS, BRITISH EAST AFRICA 1915—(*Concluded.*)

Reg. No	Station.	Observers.	Jan.	Feb.	Mar.	Apl.	May	June	July	Aug.	Sept	Oct.	Nov.	Dec.	Total	Remarks.
118	Songhor	E. E. Hutchins	0·00	1·42	8·30	7·85	9·74	...	...	...	...	...	...	...	27·31	5 months.
121	Sotik	Haslehurst & Tannahill ...	1·27	3·68	9·13	7·67	4·57	4·31	2·31	5·06	4·45	5 76	3 09	3·07	54 37	
120	Sotik, Nyangoris Park ...	J Morgan	2·50	1·01	10·14	8·27	3·45	4 84	2·01	1·32	3·39	3 25	2·74	4 30	47·22	
123	Takaungu	Dist. Comr.	0·00	0·03	3·10	2·06	15·52	13·23	4·18	0·95	2 14	2·51	0 76	0·30	44 78	
125	Thika, N'darugu ...	L. Lindsay	0·00	0·00	3 18	9·38	6·55	2·43	1·22	0·00	1·69	4·27	3 94	0 74	33·40	
126	Thika	C. L. Trotter ...	0 03	0·08	6·73	8·56	1·23	1·65	0·00	0·12	0·95	3·13	7·87	1·19	31 54	
129	Uasin Gishu	Mooi Ben, Capt. Chapman ...	0·00	0·00	3·36	3·46	4·70	6·54	2·62	0·61	0·70	3·36	1·38	2·10	28·83	
131	Uasin Gishu, Eldoret ...	Dist. Comr.	0·10	0·06	3·86	4 52	4·55	6 69	3·42	3·35	2·44	2.52	2·91	0·93	35·35	
132	Uasin Gishu, Farm 225 ...	L. A. Johnson	0·94	1·47	5·13	4·41	4·17	7·80	2·16	5·09	2·75	2 50	3·51	1·46	41·39	
130	Uasin Gishu, Kampi Simba.	E W. Pardoe	0 00	0·41	3 30	3·03	6·08	6·02	3·25	1·92	1·80	3·38	2·97	3 90	36·06	
135	Uasin Gishu, Farm 128 ...	G. A. Swinton-Home ...	0·83	0·75	4·75	4·11	2·64	8·35	1·68	8·29	0·62	2·71	2·69	2·44	39·86	
136	Ulu, Machakos	Lambert & Wilson	0·00	0·30	2·72	12·70	4·88	2 32	0·00	0·00	0·48	0·75	3·76	0·45	28 36	
155	Voi, Mbale	Dabida St. A Rogers ...	1·20	1·48	2·04	9·21	4·72	3·28	1·85	0·42	1·19	2·67	.	...	28·06	10 months.
188	Voi	Dist. Comr.	0·28	1·73	2·48	1·84	2·13	0·75	0·00	0·00	0.28	0·41	1 44	3·77	15 09	
139	Voi	Station, U. Rly.	0 80	1 73	3·09	3·22	1·98	1·99	0·00	0·00	0 58	0·32	2·73	5·94	22·38	
144	West Kenya, Farm 1248 ...	N. Barry	...	...	2·02	3·14	10·04	2 94	0·70	0 02	0·46	0·70	3·32	1·70	25·04	10 months.
143	West Kenya	Forest Station	0·68	0·68	5·00	11·31	7·05	3·56	0·79	2·52	1·44	..	...	...	33·06	9 ,,
142	West Kenya, Farm 1226 ...	S. S. Bastard	1·09	1·50	3·23	3 75	2·34	1·50	0 34	0·62	0 97	1·86	2·05	4·20	23·45	
148	Wuzi, Voi	C. M S.	...	...	6·57	17·12	5·24	...	...	...	...	...	...	..	28·93	3 ,,
149	Yala, Trading Centre ...		2·06	1·00	8·64	12·71	10·88	6·20	4·86	0 00	11·04	12 96	9·35	6·51	86·19	

ANNUAL REPORT

ON THE

ECONOMIC PLANTS DIVISION

FOR THE

FINANCIAL YEAR ENDING 31st MARCH, 1916.

DEPARTMENT OF AGRICULTURE,
Mombasa, 21st May, 1916.

THE HON. A. C. MACDONALD,
DIRECTOR OF AGRICULTURE, NAIROBI.

SIR,

I have the honour to forward herewith the Annual Report on the Economic Plants Division for 1915-16.

I have the honour to be,
Sir,
Your obedient servant,
(Sd.) H. POWELL,
(Chief of the Economic Plants Division.)

TOURS OF INSPECTION.

Circumstances caused these to be of a more restricted nature than in previous years and in consequence increased attention was given to the Mazeras Experimental Station and to other departmental matters mentioned in the report.

In view of the experience of the compiler of this report in regard to Botanic Gardens, his services were in request in connection with the commencement made by the Department of Agriculture in the laying out and planting of a Botanic Garden on the site of the "Ainsworth Garden", Nairobi. These grounds are conveniently situated and well suited for the purposes of a Botanic Garden; the establishment of which is highly desirable and as in the case of the Government Arboretum at Nairobi would provide instruction and interest to residents and visitors.

The Government Farm, Kibos, was inspected towards the close of the year and a report dealing with the visit submitted. The report contains observations in regard to the school being established at

Kibos in connection with the scheme for the training of sons of Chiefs and Headmen in practical agriculture, etc.

As usual the Annual Report on the Kibos Farm will be submitted by the officer in charge of that institution.

In agreement with the arrangement whereby men of military age and physique could be released for active service in one way or another, the Chief of the Economic Plants Division carried out the duties of Plant and Seed Inspector at Mombasa in conjunction with his own, during the period 23rd November, 1915, to 2nd February, 1916, when owing to his services being required elsewhere the plant and seed inspection work was handed over to the Tropical Agricultural Instructor.

EXPERIMENTAL PLOTS ON THE UGANDA RAILWAY.

With a view to obtaining reliable data in regard to a variety of products an experimental plot of an acre in extent was established on land adjoining the Mariakani Railway Station, and the existing small plot at Samburu Railway Station was also increased to the area of an acre.

The plants under trial at these places comprised Sisal, Kapok, Coconuts, Sugar cane, Bananas, Pine apples, Maize, Beans, Vegetables, etc.

As regards Sisal, the four year old plants on the Samburu plot show the suitability of the district to this product, and the recently established Sisal at this place and at Mariakani is also thriving. Sugar cane at both places is a failure, but Kapok is very satisfactory; one year-old plants having attained a height of upwards of six feet, and are otherwise well proportioned.

Bananas of improved varieties and Giant Papaws are a success at Samburu but not Pine apples, though the three are thriving at Mariakani.

Good crops of Maize and Beans resulted and European Vegetables were a fair success.

With regard to Coconuts, several vigorous healthy trees just arrived at a bearing age, are growing in the Native Bazaar at Mariakani, and afford encouraging evidence that the district is suited to the palm. Near Samburu Railway Station, however, strong growing Coconut trees, that should have produced nuts for some years past, are practically speaking, sterile; but whether this is due to scant rainfall or other causes is a matter for careful investigation.

From a general Agricultural point of view the Mariakani district is superior to the Samburu country, and the rich pasture affords grazing during a large part of the year for numerous small herds of native cattle, sheep and goats.

During the dry season there is a scarcity of water for man and beast though this drawback might be overcome by means of dams, wells and tanks conserving the copious rainfall.

It was intended to establish small experimental plots during the past year at Mackinnon Road, Simba, Sultan Hamud, Kiu and other places, but for Military reasons the work had to be suspended.

SANSEVIERIA.

The Kew Bulletin No. 5 of 1915 contains a Monagraph by H. E. Brown all the known species of Sansevieria, prominent among which are the species from British East Africa.

In the matter of supplying living plants of Sansevieria from the East Africa Protectorate for study and botanical determination at the Royal Botanic Gardens, Kew, the Department of Agriculture rendered appreciated service, and one of the species collected in the farm jungle has been named "Sansevieria Powellii" a figure of which with the botanical description appears on page 199 of the Bulletin referred to.

Weather.—The year's rainfall of 56·74 inches is the second heaviest recorded since the establishment of the Mazeras Experimental Station the maximum fall being 69·69 inches in the financial year 1909-10. Coming after the low rainfall of the previous two year, viz.—37·86 inches in 1914-15 and 32·14 inches in 1913-14, the copious downfall of the year under review was very welcome to the vegetation generally and in the replenishing of the Springs.

Months.	No. of days. rain.	Inches.	Greatest fall.	Date.
April 1915 ...	10	4·73	1·30	3rd
May ...	17	16·78	3·77	21st
June ...	13	12·79	2·48	2nd
July ...	9	3·73	1·03	4th
August ...	7	1 06	0 42	16th
September ...	9	3·05	1·91	3rd
October ...	11	6·13	2 13	30th
November ...	9	1·44	0·50	11th
December ...	6	5·76	1·83	1st
January 1916 ...	1	0·37	0·37	14th
February ...	Nil.	—	—	—
March ...	4	1 00	0·38	27th
	96	56·74	3·77	21st May.

SALE OF PLANTS, SEEDS AND PRODUCE.

Economic Plants	...	Quantity sold...	20,437.
Trees, Shrubs, and Ornamental plants.		do. ...	1,934.
Climbers ...	...	do. ...	157.
Fruit ...	...	do ...	621¾ doz.

Produce: a large quantity of produce, viz. Maize, Seed-Cotton, Kapok and Sugar-cane.

Free Issues: in addition free issues of plants and trees numbering 864 were made for experimental purposes.

GRAFTED MANGO.

A wardian case containing nine grafted plants of every choice varieties of Mango "Julie" (1 plant) and "Pere Louis" (8 plants) was received, from the Commissioner of Agriculture West Indies in November Enroute the plants had been received, cared for and repacked at the Royal Botanic Gardens, Kew, and to this in a large measure, was undoutedly due, the good manner in which they bore the long sea journey. No time was lost in planting the choice exotics at Mazeras though despite every attention two plants were lost during the ensuing severe dry season, but the others are, so far doing well.

Seedling, mango plants of the local varieties have been raised for providing stocks for grafting purposes. which process will be carried out as expeditiously as possible.

The improvement of the mango has long been entertained by the Agricultural Department but the difficulty hitherto has been the obtaining of grafted plants of the choice varieties from Overseas.

FRUIT.

A reference to the "returns" of fruit and plants disposed of will show that the cultivation of improved varieties of banana, pine apple, etc., at Mazeras is continuing to have the effect desired, viz.:—the extension of the production of this class of fruit in the Protectorate. Pine apple plants of the Smooth Cayenne variety also bananas are in great demand. Unfortunately the pine-apple season at Mazeras, when at its height was brought to an abrupt end by the attention of certain Troops on their way through to the front.

KAPOK (ERIODENDRON ANFRACTUOSUM).

Reference was made in the two previous years report to the experiment being conducted in the topping and pruning of these trees in order to encourage a dwarfer and more compact habit of growth. Attention has been continued in the desired direction and the success attained is considered very satisfactory. It now remains to be seen whether the yield of the pruned trees will be greater or less than the untreated ones. 130 four-year old unlopped trees yielded, during the past season, 284 lbs. of unginned Kapok, an average yield per tree of 2 lbs. 3 ounces. Another season the yield will probably be higher.

NURSERY WORK.

Large numbers of Rough Lemon and Swahili Orange seedlings have been raised as "stocks" for budding purposes. Dominica Lime plants have also been raised in quantity the demand for these being on the increase.

The propagation of economic and ornamental plants has received much attention and fair stocks of those enumerated in the Price List are in hand, but in the event of large numbers of plants being required it would be desirable if intending purchasers would send in their orders three months in advance of the date at which they wish them delivered.

PERGOLA.

A neatly constructed pergola, of hard-wood poles and wire-netting, has been erected at the main entrance to the experimental station to support the Bougainvillea plants already established there.

OLD HOUSE.

This dilapidated structure has been removed and on its site it is proposed to erect a small building to be used as an office, etc.

PUBLIC GARDEN, MOMBASA.

A general all round improvement was noticeable here due to the large quantities of rich soil added to the garden during the last two or three years; also to the planting of numerous choice exotics, and the heavier rainfall of the past season.

(Sd.) H. POWELL,
Chief of the Economic Plants Division.

ANNUAL REPORT

OF THE

TROPICAL AGRICULTURAL INSTRUCTOR MOMBASA.

FOR THE

YEAR ENDING 31st MARCH, 1916.

AGRICULTURAL DEPARTMENT,
Mombasa, April 1916.

THE HONOURABLE,
THE DIRECTOR OF AGRICULTURE.

SIR,

I have the honour to submit my Annual Report for the year ending 31st March, 1916, as Tropical Agricultural Instructor.

During the latter part of the year I acted as Plant Import and Seed Inspector.

SAFARIS.

My principal journeys for the purpose of Agricultural Instruction were through the Lamu, Tana and Mombasa districts.

Lamu.—The outstanding feature of the year on the Island was the heavy rainfall during the early months resulting in floods which caused considerable damage to the Coconut plantations. I inspected the flooded area, and at a subsequent meeting in the Liwalia Court offered suggestions to the community as to methods of drainage to remedy the state of the shambas and as far as possible guard against a recurrence of the inundation of the cultivated lands.

TANA DISTRICT.

Leaving Lamu I travelled *via* M'konumbi through the Tana District.

I was much impressed by the suitability of the district for the cultivation of the following crops:—Rice, Sugar, Maize, Guinea-Corn and Coconut.

On this tour I was able to meet a large number of the Native shamba owners and give them advice on improved methods of cultivation, selection of good seed, etc., etc.

MOMBASA & RABAI DISTRICT.

On my return to Mombasa I travelled through the neighbouring district.

The principal crops cultivated are Cereals, Rice, Vegetables and Coconuts.

At a meeting of Native shamba owners held at the District Commissioner's Court, Rabai, and at subsequent interviews with Chiefs on their shambas, I was able to give advice regarding cultivation and marketing, and with regard to the latter, pointed out the excellent opening at Mombasa for trade in good quality produce.

The areas surrounding Mombasa comprise one of the most important Coconut producing centres. I have, therefore, on my safaris made a point in laying stress on the following matters of importance:—

(1) Bad results from too close planting.

(2) Danger of keeping sick or dead palms standing in shambas.

(3) Unadvisability of using immature nuts as seed.

(4) Destructive results of Tembo tapping.

(5) Necessity of the destruction of the beetles (Oryctex Rhinocaros).

(6) To collect dry nuts and take care in curing not to produce dirty smoked copra.

GENERAL REMARKS.

Throughout these tours I have observed general increase in cultivation, and the prospects for Coconuts, Sisal, Rice, Sugar, etc. in their particular districts are in my opinion excellent.

I have previously had the honour to submit detailed reports on the above matters.

I have the honour to be,

Sir,

Your obedient servant,

(Sd.) GEORGE FARMER,

Tropical Agricultural Instructor.

ANNUAL REPORT

OF THE

FOREMAN PLANT INSTRUCTOR

FOR THE

YEAR ENDING 31st MARCH, 1916

DEPARTMENT OF AGRICULTURE,
Mazeras.

THE HONOURABLE,
THE DIRECTOR OF AGRICULTURE,
Through THE CHIEF OF THE ECONOMIC PLANTS DIVISION.

SIR,

I have the honour to submit my report for the year ending March 31st, 1916.

I obtained six months leave of absence during the above period and left the Protectorate for Europe on the 3rd of May. I returned on the 1st November, 1915.

During my absence, my duties in connection with the destruction of the Coconut beetle and native coconut cultivation generally were performed by the Tropical Agricultural Instructor.

In conjunction with my coconut duties I assisted generally at the Mazeras Farm, during the period which intervenes between the closing and re-opening of the beetle traps, and under instructions from the Chief of the Economic Plants Division visits were paid to the Experimental plots at Meriakani and Samburu and also to the Old Government Farm at Mirihini.

At the present time apart from a leaf eating insect which is hardly observed in sufficient numbers to justify the assumption that it may prove to be a serious menace to coconut cultivation, the coconut beetle is known to natives and others as the principle enemy of the coconut palm, and is commonly found in the districts visited and elsewhere, and judging from the indifference displayed generally in the matter of its extermination, it is questionable whether the serious and destructive action of which this pest is capable has been fully realised.

The question of controlling the ravages of these insects, owing to the height of the full-grown coconut palms, and their being found in places other than the coconut palm is far from being an easy one,

and some two years ago the Department of Agriculture inaugurated a system of experiments in the shape of breeding places as is done in most coconut growing countries.

These breeding places or traps are 300 in number and are situated in three of the principal coconut districts adjacent to Mombasa. Mtongwe, the other great coconut centre has not yet been visited.

The number of traps in the districts visited are as follows:—

Changamwe	District ...	72.
Rabai	do. ...	100.
Freretown	do. ...	128.
	Total ...	300.

The average number of insects collected per trap is:—

Beetles.	Grubs.	Pupae.	Eggs.
6	80	5	3

These figures however must only be taken as approximate as some of the traps along the railway line were burnt.

The traps are constructed by digging a hole about nine feet square and about 18 inches deep, into which a number of coconut stems cut into sections of about two or three feet are placed together with other decayed vegetable matter: they are visited periodically and the insects found in them are carefully collected, counted and destroyed, after which they are refilled, labelled and dated.

Prior to the construction of these traps it was no uncommon sight to see a number of fully grown dead palms standing about the various shambas in the districts visited. At the present time, judging from the healthy appearance in the growth of the young palms and the few fully grown dead palms seen, it may not be amiss to assume that the construction of these traps has fully justified the purpose for which they were intended, *i.e.* to attract the beetle from the palm to the trap.

Certain shamba owners at Changamwe after seeing the number of insects caught in traps in a day have expressed their intention to construct traps on their shambas: as a matter of fact two traps have already been established on a certain shamba.

It has been clearly pointed out to the Native shamba owners willing to undertake the making of their own traps that it must be borne in mind that such places must be examined three or four times during the year and any insects collected should be destroyed, otherwise the traps will be serving the opposite purpose for which they were intended.

In regard to Coconut cultivation among Natives I regret being unable to report any improvement in this direction, though it would be wrong to give an idea of utter lack of interest in the matter. It is also to be regretted that irregular and close planting is so very general and is still being extensively done in all the districts. These matters have been pointed out to Native shamba owners.

It is also a common practice to plant as seeds the nut in the stage locally known as "Koroma" which is the name in Kiswahilli given to the nut when it is just about half way between the ripe and the unripe stage, and when the meat will require a knife to remove it from the shell.

Indeed it has been observed that in many cases copra was being prepared from the same kind of nut, thus entirely ignoring the fact, that in order to obtain the largest yield of copra and incidentally of oil, only thoroughly ripe nuts should be used.

Lack of thorough cultivation is also very much in evidence in the various districts and notably at Changamwe.

The practice of making notches in a tree in order to facilitate climbing is still being indulged in and is to be deprecated, being in most cases the forerunner of disease.

In the various districts visited the coconut tree is a living factor as a source of water supply among the Natives who reside on their shambas. During the rains a bit of the dry frond, usually the terminal end about 4 feet long is tied to a tree, on the plantation, at about 3 feet from the ground under which various kinds of receptacles are placed to catch the rain water.

In the matter of tembo production, the Native is still where he was years ago, and if anything his efforts are more progressive in this direction than in any other which affects the coconut palm. Indeed there are quite a lot of them who regard tembo tapping to be of greater importance than the production of copra, and being a source of wealth to them, in the shape of "ready cash money" their best palms are reserved for that purpose.

In order to prevent breeding places other than traps it is most imperative that dead trees lying about in the various shambas be burnt or destroyed by the shamba owner, in his own interest and as a matter of controlling the beetles from attacking neighbouring shambas. This has been insisted on when conversing with shamba owners.

This matter requires attention in view of the proximity of Native shambas to shambas owned by Europeans and others who are laying out much capital on coconut cultivation, and to whom a shamba with dead palms lying about infested with beetles within a couple of hundred yards of their own plantation must certainly prove to be undesirable.

Another matter of importance is the great necessity for "fire lines" between the various shambas, and the careless manner in which fires are made, apparently for the purpose of burning bush, and often spread uncontrollably into neighbouring shambas and invariably a lot of damage is inflicted as a result.

I have the honour to be,

Sir,

Your obedient servant,

(Sd.) J. B. DOPWELL,

Foreman Plant Instructor, Mazeras.

ANNUAL REPORT
ON THE
GOVERNMENT EXPERIMENTAL FARM, KIBOS.
FOR THE
YEAR ENDING 31st MARCH 1916.

DEPARTMENT OF AGRICULTURE, KIBOS.

THE HONOURABLE,

THE DIRECTOR OF AGRICULTURE, Nairobi.

SIR,

I have the honour to submit my Annual Report on the Government Experimental Farm, Kibos, and on the Agricultural Instruction work undertaken by me in the Kisumu and Mumias districts for the year ending 31st March, 1916.

RAINFALL AND WEATHER CONDITIONS.

Both as regards quantity and distribution the rainfall during the year was a distinct improvement on the previous four or five years. Not only has this been so at Kibos but throughout all parts of the district as testified by the crops grown there, in both the long rainy season as well as the short rainy season.

High easterly winds, thunderstorms, and to a lesser extent, hailstorms were recorded as usual but the damage done by these was insignificent.

The following is a table showing the rainfall from April, 1915, to March, 1916.

Month.	Quantity in inches.	No. of days on which rain fell.	Date.	Greatest fall. Inches.
Long Rains.				
April	6·79	15	1st	1·70
May...	5·83	14	14th	1·14
June...	8·69	13	10th	2·50
July...	1·02	5	6th	·81
August	2·89	7	17th	1·51
Short Rains.				
September	3·69	12	19th	1·75
October	4·71	9	4th	2·15
November	3·50	7	11th	1·80
December	4·44	8	30th	1·80
January	2·42	6	24th	1·32
February	3·29	9	25th	1·47
March	5·29	10	24th	1·70
	52·56	115		

NURSERIES.

A further slight addition was made to the nursery through uprooting a number of Ceara rubber trees growing on the adjoining piece of land. This additional area together with the old piece was heavily manured with cow dung manure and the whole carefully raised into beds which were used for raising cuttings and seedlings of the following:—Coffee, Chillies, Papaws, Guavas, Limes, Lemons, Eucalyptus, Black Wattle, Iron Wood, Tobacco, also a variety of Vegetables.

CROP EXPERIMENTS.

Want of funds necessitated the curtailment of the area which has been under cultivation on the previous year. The 14 acre plot of land situated on the river side of the farm, having been practically all planted with permanent crops of one kind or another, most of the above experiments were conducted on a block on the easter portion of the farm. The land was divided into a number of 5 acre plots and after having been given the usual preparation was put under the following crops:—Beans, Chillies, Cotton, Maize, Rice, Sim-Sim, Sugar-cane, Tobacco, Fruit trees, Timber trees.

BEANS.

The trials with these included three varieties, *viz.* Canadian Wonder, Haricot and Rose-cocos. Although the first named as heretofore proved a heavier cropper than either of the other two, owing to the more uniform rains which occured during the short rainy season, during which the plot was planted, all the varieties gave far better results than on any previous occasion. The varieties were grown either as an intermediate after maize, or as a catch crop between coffee or fruit trees.

The following is a table of results:—

Variety.	Area Acres.	Planted.	Reaped.	Average yield per acre.
Canadian Wonder ...	2	Sep. 1st	Nov. 9th	920 lbs.
Rose Cocos ...	3	„ 5th	„ 17th	870 lbs.
Haricot ...	1	Aug. 18th	Oct. 31st	750 lbs.

CHILLIES.

A small area was put under with two varieties of Chillies but the experiment was discontinued before the usual second harvest was obtained from the long Mombasa variety or the Nyasaland had come into full bearing, as the piece of land on which the experiment was carried out was required for extending the fruit plot. The results obtained however were useful in demonstrating the advantage there is in first sowing the seed in nursery beds, and when the seedlings are an inch or too high to transplant to other beds at a distance of 6 to 9 inches, were they should remain until they are fit for planting out in the fields. This method encourages the development of vigorous root system and though more expensive than that usually practiced

at Kibos, *viz.*, to let the seedlings remain in the bed in which they are planted until they ready for putting out in the fields without transplanting. has the advantage in producing a much more vigorous and prolific growth.

The following is a table of results:—

Variety.	Area Acres.	Planted,	Reaped.	Average yield per acre.
Mombasa long ...	1	May 4th	Aug. 4th	310 lbs.
Nyasaland small ...	½	,, 8th	Sep. 25th	175 lbs.

Cotton.—Owing to a failure to obtain good seed in time for planting in season, this is one of the few crops which yielded no results. The young plants appeared to make good growth at the beginning but later received a check which caused premature flowering and the splitting open of the bolls. The plants in a portion of the field were cut back with a view to encouraging fresh growth, but this did not seem to cause much improvement.

It is possible that the somewhat impoverished condition of the piece of land on which this experiment was carried out may have largely contributed to this failure.

Owing to the unsatisfactory state of the market the Natives were not encouraged to plant any cotton during the year.

Groundnuts.—A few rows were planted with groundnuts at the northern end of the timber plot, but the plants developed the disease which killed the industry some years ago.

Maize.—This experiment was conducted along similar lines as that of the previous year and included the same varieties. It was divided into 2 separate parts—one planted 4 ft. by 2 ft. and the other 3 ft. by 2 ft. Planting was carried out in April and May, The May planted Hickory King suffered slight damage through standing water, but the growth on the whole was healthy. This experiment again demonstrated that the wider distances were more suitable for the Hogan variety whilst the closer distances were more suited to the Hickory King variety. This latter variety is now being grown at Kibos to the exclusion of the other varieties being produced some years ago.

Issues of good Hickory King seed were made to the Districts of Kisii, Kericho, Kisumu and Mumias and visits paid by the writer to the two last mentioned to see that the seed was properly planted and to advise the Natives with regard to the steps necessary for keeping the variety pure.

The following is a table of results : —

Variety.	Area.	Planted.	Reaped.	Yield per acre.
Hickory King 4′ x 2′	2	April	August	1600 lbs.
Hickory King 3′ x 2′	4	May	August	1800 lbs.
Hogan 4′ x 2′	4	April	August	2000 lbs.
Hogan 3′ x 2′	3	May	August	1900 lbs.

Upland Rice.—Planted with the beginning of the rains in March this gave very good results as a catch crop between the rows of fruit trees in the fruit plot. Two methods of planting were tried, one consisted of opening shallow holes with the hoe and sowing a few seeds in each. The other method was to sow in drills and to transplant the seedlings leaving a stand of plants 18 inches by 18 inches, There was little to choose between the growth of the plants in either experiment though the first mentioned method had the advantage over the latter in that it saved the expense of transplanting.

The following is a table of results :—

Variety.	Area.	Planted .	Reaped,	Yield per acre.
Gumpty ...	1½	March	July	1000 lbs.

Sem Sem.—Owing to the loss of the other varieties through a mixture of seed at the time the crop was harvested the previous year, only a small experiment was carried out with this crop from seed of one of the imported varieties which remained over after planting during the previous season was done. The growth of the plants was steady and the results again showed that planted at the beginning of the short rains this variety is a much heavier cropper than the local native varieties.

As a Native Industry Sem Sem continues to grow more and more in the Nyanza Province the output having risen fourfold in certain Districts during the 4 years.

The following is a table of results :—

Variety.	Area.	Planted.	Reaped,	Yield per acre.
Ceylon Brown ...	1½	Sept.	December.	450 lbs.

Uba Sugar Cane.—From the 6 stools of the above cane raised from 12 cuttings received from the Head Office 2 years ago a sufficient number of cuttings to plant an acre and a half were obtained. The plot was ploughed and cross ploughed twice, trenches opened 7ft.

apart, and the cuttings laid across the bottom of these 6ft. apart and covered to a depth of a few inches. As the plants developed the soil was drawn round about the roots until the trenches were filled in level with the surrounding surface. By this method growth was very rapid and at the time of writing 12 months from date of planting the stools have literally covered all the space between the rows and the somewhat slender canes in these average a length of 8ft. each.

This cane which has the reputation of being a particularly good drought resister is attracting much attention from visitors to the farm.

Arrangements are being made for extending this series of experiments with a supply of cuttings of a seedling variety expected from the Government Farm Kabete.

Tobacco.—Of the 21 varieties of Tobacco with which experiments were started some years ago all but three have through one cause or another but especially to the coarse texture and somewhat high nicotine content of the leaf been deleted from the experiments. It has been found that on medium loams such as occurs at the Farm most of the varieties of Tobacco were inclined to make rank growth when the wider planting distance such as 3 ft. by 3 ft. were adopted, but by adopting the close distances 3ft. by 18 inches better results were obtained.

Except in the case of the Orinoco variety on which mildew appeared towards the end of the season all the varieties made equally healthy and rapid growth.

Although for the reasons already stated and owing to the absence of suitable buildings for effectually curing the leaf no attempt has been made to turn out high grade leaves at the Farm, these and past experiments have shown that a type of Tobacco suiting the tastes of medium to strong smokers can easily be produced under the existing conditions on the Farm.

The following is a table of results :—

Variety.	Area Acres.	Planted.	Reaped.	Yield per acre.
White Burley ...	½	10th Apl.	June	400 lbs.
Orinoco ...	½	12th Apl.	July	325 lbs.
Gold Finder ...	½	14th Apl.	July	200 lbs.

PERMANENT CROPS.

Coffee.—Owing to the appearance of Coffee Leaf disease on the old plants this experiment received a somewhat severe set back during the year spraying with Bordeaux Mixture and Liver of Sulphur in accordance with recommendations made by the Government Mycologist was carried out but this treatment only rid the plants of the disease for a short time. Arrangements are being made for carrying a further series of spraying experiments on the diseased trees next dry season.

As damp conditions and dense shade are considered to be favourable to the development of this desease all the Banana plants shading the coffee were taken out. The soil around the roots of the plants was raised in banks and the coffee kept regularly pruned to reduce the chances of further attack.

Cocoa.—Repeated trials have been made with Cocoa but so far none of these have produced satisfactory results. The early growth of the seedling has always been most promising but once planted out in the field they undergo a sudden check in growth and continue to become sickly until they die. As this occurred to plants well shaded as well as those out in the open it is possible that the soil conditions at Kibos are unsuitable to the plant.

FRUIT & TIMBER TREES.

The young Citrus trees continue to do well. A further addition of 30 young budded orange trees was made to those already planted out. All of these have put on good growth.

Four of the older trees produced a fine crop of good sized fruit the quality of which was an improvement on the previous year. Arrangements are in hand for still further extending the planting of budded trees.

Mangoes.—The three old trees near the compound produced an abundant bloom but the fruiting was very sparse. A general pruning of the branches and roots was carried out to see what effect this would have on the bearing powers of the trees next season.

With the exception of the variety known as Kiarabu which appears to be a slower grower than the 2 other varieties viz., Dodo and Masikio ya Punsa, all the young plants in the fruit plot made good growth.

Coconuts.—The 4 old trees also 3 of the younger trees flowered freely but only one of these which is carrying 5 matured and 2 nearly matured fruits at the time of writing developed any fruit.

The young plants in the fruit plot are making slow growth.

Papaws.—Practically all the old plants in the fruit plot were taken out and replaced with young plants raised from fresh seed obtained from the Mazeras Farm. The size of the fruits of these have been undergoing rapid deterioration though the quality continued good.

Pineapples.—An appreciable extension was made to the Pinery during the year. The suckers enabling this to be done being obtained from the old plants which were all taken up at the end of the fruiting season and the beds remoddled and manured. Applications for suckers of the smooth cayenne variety continued to be more than our stock enabled us to deal with.

The Pinery furnishes a most useful demonstration as to the advisability of planting the suckers on well prepared beds, where the soil is a medium black loam like that at Kibos.

OTHER FRUITS.

The other fruit trees in the fruit plot include, Pommegranate Sugar Apple, Jack Fruit and Cashew. With the exception of the first and last mentioned which produced a small crop of fruits during the year these made somewhat slow progress.

Under the new scheme of work referred to in a later portion of this report fruit growing will be made a feature of the planting programme and as already stated arrangements are in hand for carrying this out next season.

Timber Trees.—This plot only 3 years old has already justified its establishment. Hundreds of poles for the erection and repairing of Farm Buildings have been already obtained and large quantities of seed gathered from the trees which include Eucalyptus, Black Wattle, Iron Wood, Rain Tree and Grevillea robusta have been distributed and planted in the nursery.

Labour.—There has been a revival in the large number of applicants for work mostly Luo and WaMaragoli during the year. The rate of wages has continued the same Rs. 4 to 6 with posho.

Live Stock.—There were only two losses by disease among the farm oxen this year. A slight outbreak of Rinderpest occurred among the native cattle in the neighbourhood but this was of very short duration.

Visitors.—Besides official visitors a large number of Kisumu Residents also Officers and men serving with the colours in the country visited the farm for the purpose of seeking advice on Agricultural matters in which they were interested.

DISTRIBUTION OF PLANTS AND SEED.

Just as the natives have been becoming more and more alive to the importance of planting other and better crops than their ordinary food crops so also has the demand on the stock of seed and plants raised on the farm been increasing and during the year under review this increase has been most striking.

The following is a list of seed, plants and trees distributed to natives for planting during the year :—

Banana suckers	560
Cane Plants	100
Lime Trees	35
Lemon Trees	65
Giant Papaw Trees	50
Giant Papaw Seed	½ lb.
Upland Rice Seed	240 lbs.
Chillie Seeds	75 lbs.
Swamp Rice Seed	60 lbs.
Beans	240 lbs.
Maize	6½ tons.
Tobacco Seed	1 lb.
Eucalyptus Seed	1 lb.
Iron Wood Seed	4 lbs.
Iron Wood Trees	108

AGRICULTURAL INSTRUCTION.

In addition to the usual Agricultural Instruction tours throughout the Kisumu District a new departure in the shape of a scheme for the Agricultural training of a limited number of native youths on the farm was introduced by the Hon'ble the Provincial Commissioner of Nyanza who in accordance with an arrangement with the Department of Agriculture took over control of the management of the farm towards the end of the year.

At the time of writing 22 boys mostly sons of Chiefs and Headmen have already been admitted, a number of temporary buildings including School, Boys Dormitory, Headman's House and Schoolmaster's House have been erected and a special time table regulating the hours for out-door work, school work and recreation on lines calculated to encourage the pupils to take a lively interest in their new occupation was introduced.

For reasons already stated no cotton was planted by the natives during the year but during the Agricultural Tours referred to the improvement of the Hickory King Maize industry and the introduction of such minor crops as onions, chillies, etc., received careful attention.

I have the honour to be,

Sir,

Your obedient servant,

(Sd.) H. H HOLDER,

Plant Instructor.

ANNUAL REPORT

ON THE

GOVERNMENT STOCK FARM, NAIVASHA

FOR THE

FINANCIAL YEAR ENDING 31st MARCH, 1916.

DEPARTMENT OF AGRICULTURE,
Naivasha, June 16th, 1916.

THE HON. THE DIRECTOR OF AGRICULTURE,
NAIROBI.

SIR,

I have the honour to submit my Annual Report for the year ending 31st March, 1916.

The rainfall during the year was as follows :—

1915	Inches.
April	4·01
May	4·91
June	3·62
July	2·44
August	0·28
September	1·68
October	1·16
November	1·59
December	1·27
1916	
January	3·11
February	1·98
March	1·18
Total ...	27·23

The above rainfall suited all stock on the farm, and in consequence they were in good condition throughout the year.

During the year the cattle did well and the increase was good. The pure bred Shorthorns had an excellent season ; the Lincoln Red Shorthorn giving a larger return of calves than the beef breed. The Friesland cattle continue to be a success and are good breeders. The pure bred Hereford cattle, as mentioned in all my previous reports, have not come up to anticipation and the increase is very low. The

Ayreshire cattle have again fulfilled expectations ; the increase being splendid. The only cattle to compare favourably with them in increase are the Friesland, and then the Lincoln Red Shorthorn grade. The Guernsey cattle have thriven and the Guernsey Shorthorn cows also, and are good milkers.

Grade Cattle.—The grade Shorthorn crossed with the Native cattle are giving satisfactory results and are nice animals and good milkers.

The grade known as the Guernsey-Shorthorn, is Guernsey on Native and then Shorthern in each cross afterwards. These cattle are good and are worthy of special notice for dairy farming. I have mentioned this grade in my reports for the last six years as of good promise.

The Friesland grades are bred from imported Cape Colony grade cows and are of fine quality.

The Hereford grade cattle are doing much better now and we have good crosses in this line, but they are exceedingly poor milkers and not the best of breeders.

The Ayrshire grades are also a success and they cross well with the Native beast.

The Friesland and Shorthorn cattle imported from South Africa by the Director of Agriculture in June 1915, have done well and are a credit to any country. The Shorthorn cattle came from Scotland to South Africa and were then brou ght up here.

The Friesland bulls purchased from Sir George Farrer at the same time are splendid animals and so are many of the heifers purchased from Mr. J. D. Van Niekerk, Brakfontien, Bedford, C. P.

Sheep.—We have many varieties and grades of sheep on the farm, including pure Merino and pure Suffolk, grade Merino, grade Lincoln Merino, grade Down Merino and grade Welsh Merino. We have the above up to the 6th and 7th crosses, and the wool of the higher grade merino is equal to a great deal of pure Merino wool and is well reported upon by our London Agents.

The Suffolk crosses give a very nice mutton animal and the demand for rams of this grade was very marked at the last Annual Sale.

The stud ewes and rams purchased from Messrs. Faulkner and Sons, Boonoke, have bred excellently, and we have reared some very nice rams and ewes from the importation, which are now pure Boonoke blood but bred in East Africa.

The clip was good, the weight of fleece per animal being about the same as previous years. The report on the clip was very satisfactory, and the prices obtained were very good, considering the times, being 11d per lb. for pure Merino ewe fleeces, 10d. and 10½d. per lb. for grade Merino fleeces.

These prices pay us very well and compare very favourably with those obtained by any other country.

Our shearing costs from five to six shillings per hundred animals, while the cost is much higher in other countries: indeed the general labour expenses in connection with the sheep and shearing are much cheaper here than in many places, while the increase here is as good and in many instances better.

For the welfare of a flock I believe in plenty of salt, and I am now inclined to think that sheep want a little lime and I am also of this opinion re cattle.

The sheep on the farm are certainly an eminently paying proposition, taking into account the wool increase and sales of sheep.

I find that the pure Merino sheep and pure bred lambs are just as hardy as any of the grades. As regards dosing, I have used the same as in previous years, that is, Cooper's powder sheep dip and salt, and Cooper's powder sheep dip and bluestone; the latter in liquid form and the former in dry state All sheep treated are fasted for 20 to 24 hours previous to dosing.

Goats.—The Angora and the grade Angora goats here have been healthy and the increase is good.

The price obtained in London for the mixed mohair was one shilling per lb.

The improvement in the Native goat when crossed by the pure Angora is very marked, in each successive cross this is clearly to be seen.

Donkeys—The crossing of the Native donkey with the imported Catalonian Jack is a success. The progeny are very nice large animals and are in great demand.

The new Catalonian Jack imported in June, 1915, is in good condition and I expect good results by putting him to the half breds of the other jack, as he is a very fine animal.

Ostriches.—These birds continue to thrive, but owing to the slump in feathers the return is not great. However, it is intended to keep them, and I am of opinion that they will improve in market value in the near future.

Horses.—The stallion "Royal Fox" is still in demand by the settlers. He has proved himself a good foal getter and his progeny are of excellent quality. The Arab stallion has been used for service with the donkeys, the results of which are not yet available.

Pigs.—The few pigs here, Large Blacks, Tamworths and Berkshires, have had a satisfactory season.

Sale.—The Annual Sale took place on the 25th February, 1916. A large number of buyers were present and bidding was brisk, while the prices obtained were exceedingly good considering the disturbed times.

7 Friesland bulls sold from £47 to £98,
5 Shorthorn ,, ,, £46 to £84,
3 Ayrshire ,, ,, £50 to £120,
1 Hereford bull sold at £74,

2 Shorthorn-Guernsey crosses sold at £54 and £74, respectively,
1 Friesland grade bull sold at £42,
3 Third cross Shorhorn grade bulls sold from £16 to £34,
1 ¾ Shorthorn bull sold at £12,
4, 3rd Cross Guernsey-Shorthorn grade bulls-£12 to £20,
3, 2nd Cross Ayrshire grade bulls, £14 to £36,
2, 3rd Cross Hereford grade bulls, £9 to £13,
2, Half bred Shorthorn cows sold at £30 and £38, with calves at foot,
2, 2nd Cross Guernsey, Shorthorn grade cows £28 and £32,
3 Half bred Ayrshire cows, one with calf at foot, sold from £24 to £34-13-8,
1 2nd Cross Ayrshire cow sold at £ 30,
100 Pure Merino rams averaged £3-6-8 highest bid being £7,
15, 2nd and 3rd cross mutton grade rams sold at an average of £4-4-0, top price being £6.
50 Cull Merino ewes and hoggets sold at 12 shillings and 10 8,
150 Grade ewes sold at an average of 16/4,
3 Pure Angora rams at an average of £1-8-0,
10 Grade ,, ,, 17 s.
50 Grade Angora ewes ,, 11 s.
7 Half bred Catalonian Jackasses averaged £8-5-8.

General Remarks.—None of the stock have been pampered or kept in a way that any private person could not do. All the pure bred stock, both cattle and sheep, are out day and night all the year round, that is, they are grazing all day and are in bomas of wire without any covering at night.

No animal is fed unless sick or run down. All bulls both pure and grade, are grazed out and not fed until about 10 or 12 months old, when they then get a little meal night and morning, but graze out in the day time as usual.

Of course the stud bulls on the farm are always under cover at night, though the sheds are always more or less open. They are also fed on mealie meal and grass hay : the quantity of meal given per day varies from 6 to 10 lbs.

Although the cattle have bred well, the loss from various causes scour in calves, tick diseases and accidents, has been greater during the year under review than in any other year during the time I have been on the farm.

Among ewes the general deathrate was low, but as regards grade lambs it was higher this year than usual, and much higher than in the pure Merino lambs.

To the pure Merino rams during the tupping season I always give a feed of crushed maize. I am also a believer in giving young Merino rams in this country a little feed of some kind,—lucerne or crushed maize,—and graze them out all day. I find they do ever so much better when treated in this way ; the feed being discontinued at a later date and resumed at tupping time.

The labour during the year, especially herds, has been very bad. A number of thefts in sheep have occurred, probably being due to the unsettled state of things during our Border War.

Wild animals viz., Leopards, Cheetas and Lions have been much more numerous during this year than previously, with the result that we lost a few sheep and a very valuable shorthorn bull.

Owing to the demand for milk by the Military Hospitals some 40 gallons of milk has been supplied daily from the farm.

During the year all the cattle on the farm have been tabulated in stud book form, as also all the stud animals sold within the last 13 years, and the records will now form a nucleus of an East African Stud Book.

The Stockman, Mr. C. B. Armstrong, was transferred to the Kabete Experimental Farm on the 3rd March of this year and Mr. W. McNaughton came here from Kabete.

Cultivation.—Some 180 acres of land on the Naivasha Lake frontage has been brought under cultivation which is being planted out with the following crops :—

Lucerne, Teff Grass, Maize, Wheat (various varieties), Mangels, Rape, Sugar Cane, Sweet Potatoes, Potatoes, Pumpkins, Barley, Oats, Paspalum and Teosinti, and it is anticipated that by the cultivation of these crops not only will important information be obtained for surrounding Settlers but that the necessary supplementing food will be supplied for the requirements of the Stud Farm.

I have the honour to be,
Sir,
Your obedient servant,
(Sd.) N. A. McGREGOR,
General Manager.

ANNUAL REPORT

OF THE

MANAGER, NAIROBI EXPERIMENTAL FARM, KABETE

FOR THE

YEAR ENDING 31st MARCH, 1915-16.

DEPARTMENT OF AGRICULTURE,

NAIROBI EXPERIMENTAL FARM,

Kabete, June 1916.

TO THE HONOURABLE,

THE DIRECTOR OF AGRICULTURE,

Nairobi.

SIR,

I have the honour to submit my eighth Annual Report on this farm, for the year ending March, 31st 1916.

Weather.—Good crops were obtained during the first season owing to the very favourable rains in April, March and June. The second Season's crops were very disappointing owing to great shortage in rain in December and January. Rain commenced at the end of January and continued during February and March with the result that certain crops in place of being harvested in March, were not reaped until June, 1916.

Table A. (Meteorological)

Latitude:—1° 17′ 30″ S; Longitude:—36° 59′ 31 78″ E; Height above sea level:—6,000 ft.

Month.	Inches Rainfall.	Highest Rainfall.	Date of Highest Rainfall.	No. of Days with 0·01″ or over.	Average Minimum Temperature.	Average Maximum Temperature.	Average Dry Bulb	Average Wet Bulb.	Average Ground Thermometers.	
									4 ft.	1 ft.
1915.										
April	8·85	1·78	17th.	17	58·1	73·6	65·7	61 6	72·6	70·5
May	6·46	1·60	13th.	22	52 2	71·2	63·5	60·7	71·1	68·5
June	5·28	1·26	8th.	19	53·7	69·7	60·4	59·2	70·0	67 2
July	0·14	0·05	19th & 31st.	4	48·6	72·4	59·2	57·8	69·6	68·0
August	0·04	0 02	16th.	3	48·2	71·8	58·4	58·0	69·1	67·4
September	2·03	0 71	24th.	11	49·5	76 5	63·0	58·1	71 1	70·3
October	0·31	0·28	29th.	2	51·9	79·1	63·8	53·1	72·1	72·2
November	7·90	1·95	10th.	17	53·8	71·1	62·6	59·6	69 7	66·9
December	0·38	0·17	15th.	6	50·8	72·8	64·8	62·0	69·3	69 1
1916.										
January	3·76	2·66	30th.	6	50·4	76·8	66·1	60·3	70·9	71·6
February	2·50	0·72	12th.	10	51·7	76·5	65·8	62·1	71·2	71·1
March	3·42	1·66	16th.	10	52·3	77·3	66·4	60·9	72·4	71·4
Total ...	41·07	...	...	127	51·7	74·1	63·3	59·4	70·7	69·5

Table B. (Meteorological)

	1910-1911.	1911-1912.	1912-1913.	1913-1914.	1914-1915.	1915-1916.
Rainfall	31·67″	54·34′	51·17″	30·04″	37·62″	41·07″
Number of days with rain	129	143	148	143	112	127
	May :—	February :—	April :—	March :—	April :—	January :—
Wettest month with rainfall	5·96″	13·90″	12·19″	9·09″	10·00″	2·66″
Mean :—Dry Bulb	63·6	61·9	62·1	61·6	63·1	63·3
Mean :—Wet Bulb	56·3	56·8	57·6	56·9	58·4	59·4
Mean : —Maximum Thermometer ...	72·8	73·5	72·6	73·6	74·9	74·1
Mean :—Minimum Thermometer ...	50·1	51·6	51·7	52·5	53·00	51·7
Mean :—Ground Thermometer 4 feet ...	...	...	69·3	69·5	70·8	70·7
Mean :—Ground Thermometer 1 foot ...	...	...	68·3	68·5	69·9	69·5

There were no violent storms during the year. 2'66 inches of rain fell on the 30th January, but owing to the long continued drought, this was immediately absorbed by the soil without damage.

July and August were the coldest months, whilst February and March were the hottest.

Linseed.—An area of 6¼ acres was sown on the 16th April, at the rate of 80 lbs. per acre, with seed twice grown on the farm. This crop gave an excellent stand of linseed, and from it we were able to produce some of the best flax we have had on the farm. From our experience with this crop it would seem established that in course of time an industry exporting superior flax from this country is in prospect.

A further area of 3 acres was sown on 20th April with seed imported from Bombay. This crop was badly infested with caterpiller which prevented us from harvesting any seed from the area. The quality of this straw also was not good.

Three small samples of flax fibre were sent to the Imperial Institute on the 8th March, 1914 and were reported upon as follows :—

Reg'd No. 59712.

COPY OF REPORT.

IMPERIAL INSTITUTE OF THE UNITED KINGDOM.

THE COLONIES AND INDIA.

Report on Flax from the East Africa Protectorate.

The three samples of flax which are the subject of this report were forwarded to the Imperial Institute by the Manager of the Experimental Farm, Kabete, with letter No. R. 133/15, dated the 8th May 1915.

The samples, which were stated to represent the best flax yet produced on the farm, were intended primarily for exhibition, but it was thought that it would be of interest to submit them to fibre merchants for commercial valuation in continuation of the previous investigations of samples of flax forwarded to the Imperial Institute from the farm (see Imperial Institute reports, dated the 26th February and 13th May 1914).

Description of Samples.

The samples, which were unlabelled, consisted of three small bundles of scutched flax, very similar in appearance and weighing 1¼ lb., 1 lb. and 1¼ lb., respectively. The preparation of the fibre was quite satisfactory, the samples being well cleaned and prepared, free from shieve, bark or gum, and of good colour.

The fibre in each bundle was however slightly discoloured at one end. The strength was good on the whole and the length of staple was about 2 feet 5 inches, although some shorter fibre was present.

The samples of flax are much superior to any of the samples from the East Africa Protectorate previously examined at the Imperial Institute.

Commercial Value.

Samples of three bundles were numbered respectively 1, 2 and 3 at the Imperial Institute, and submitted to fibre merchants in London for valuation.

The merchants reported that sample No. 1 was a long well-grown flax, strong and of medium warp quality, adding that it was well scutched and compared favourably with medium Belgian Flax. No. 2 was of similar quality but rather stronger. No. 3 resembled the other two samples, but was a slightly softer and more spinnable fibre.

The firm valued the samples in London at the present time as follows:—

No 1, from £110 to £115 per ton; Nos. 2 and 3 from £115 to 120 per ton. They stated that flax represented by these three samples would be readily saleable and would be suitable both for Scotch and Irish spinners.

The firm also mentioned that at present there is no market price for flax and that there are great fluctuations in the quotations. They were of opinion, however, that should present conditions continue the prices quoted for these samples would be obtainable for consignments of similar character.

Samples of the three flaxes, numbered as stated above, are returned with this report for purpose of reference in the East Africa Protectorate, dated 3rd September, 1915.

MAIZE VARIETY EXPERIMENTS.

FIRST SEASON:—AREA 23·02 ACRES.

Variety.	Planted.	Duration.	Harvested.	Yield per acre.
Hickory Horse Tooth.	1915 29th—30th Mar.	About 6 mths.	1915 Aug. 8th	1,393 lbs.
do. ...	do.	do.	,, 9th	2,596 lbs.
Ladysmith White ...	27th—29th Mar.	do.	Sep. 29th	3,439 lbs.
do. ...	2nd April.	do.	Oct. 4th	1,478 lbs.

An area of 8·48 acres was planted on 29th—30th March, 1915 and harvested on the 8th August, 1915. Half of this area had lain fallow during the previous season and half had carried a crop of beans. The yield from the portion after fallow was 1,393 lbs. per acre, and the portion after beans gave yield of 2,596 lbs. per acre. The whole plot received the same treatment as regards planting, harvesting and general cultivation. The superior growth of the bean portion of the area was most marked almost from germination and the result is worthy of the attention of Settlers.

BEANS.

BEAN VARIETY EXPERIMENT.

First Season:—Area 58 Acres.

Variety.	Planted.	Duration.	Harvested	Yield per acre
	1915	About	1915	
Rose Cocos ...	5th May	4 months	30th Aug.	709 lbs.
Canadian Wonder ...	7th May.	do.	6th Aug.	842 lbs.
Noyau au Blanc ..	30th April.	do.	13th Aug.	628 lbs.
Braila Flat White ...	20th May.	do.	16th Sep.	302 lbs.

Second Season:—43·48 Acres

Variety.	Planted.	Duration.	Harvested.	Yield per acre.
	1915	About	1915	
Canadian Wonder ...	11th Nov.	4 months	11th Feb.	374 lbs.
Noyau au Blanc ...	6th Nov.	do.	9th Feb.	383 lbs.
Rose Cocos ...	17th Nov.	do.	4th Mar.	359 lbs.
Braila Flat White ...	12th Nov.	do.	15th Feb.	459 lbs.

During the first season we had good rains and in the second rain only fell when the crop was planted and none during their growth.

BEANS etc.—(Small Plots).

First Season.

Variety	Planted.	Harvested.	Yield per acre.
	1915	1915	
Canadian Wonder Beans.	17th April	17th August	1,480 lbs.
Field peas	14th ,,	28th ,,	1,080 lbs.
Rose Coco (Selected) ..	19th ,,	17th ,,	1,400 lbs.
Flagelot Beans ...	17th ,,	14th ,,	1,810 lbs.
Lentils (Egyptian) ...	17th ,,	26th ,,	1,225 lbs.
Broad Beans ...	17th ,,	28th ,,	652 lbs.
Butter Beans ...	19th ,,	10th ,,	990 lbs.
Telephone peas ..	17th ,,	28th ,,	900 lbs.
Noyau au Blanc ...	19th ,,	7th ,,	965 lbs.
Rose Coco	19th ,,	17th ,,	1 250 lbs.
Stratagem Peas ...	19th ,,	28th ,,	1,340 lbs.
White Coco Beans ..	19th ,,	28th ,,	1,230 lbs.
Schmaltzbahnen ...	17th ,,	7th ,,	945 lbs.
Horse Beans ...	16th ,,	3rd September	872 lbs.
American Wonder Peas ...	16th ,,	3rd ,,	740 lbs.
Indian Gram ...	17th ,,	Failure	

BEANS, ETC.—(SMALL PLOTS).

SECOND SEASON.

Variety.	Planted.	Harvested.	Yield per acre.
	1915	1916	
Broad beans ...	2nd Nov.	8th April	1,069 lbs.
Schmaltzbahnen ...	,,	18th Feb.	540 lbs.
Canadian Wonder ...	,,	,,	450 lbs.
White Coco	,,	,,	720 lbs.
Lentils—Egyptian ...	,,	,,	950 lbs.
Rose Coco (Selected) ...	3rd Nov.	20th Feb.	490 lbs.
Butter beans ..	2nd Nov.	3rd Feb.	375 lbs.
Noyau au Blanc ...	,,	,,	720 lbs.
Flagelot	,,	18th Feb	810 lbs.
Indian Gram ...	3rd Nov.	Failure	
Telephone Peas ...	3rd Nov.	22nd Feb.	1,125 lbs.
Horse beans ...	2nd Nov.	Failure	
Soya beans 88 ...	,,	10th March	180 lbs.
,, ,, mammoth ...	,,	10th March	198 lbs.
Cow pea—New era ...	,,	Not yet harvested	
,, Giant ...	,,	,,	
,, Brabham 103 ...	,,	,,	

The Soya beans and cow peas have been grown from seed which the Department of Agriculture, Washington, D. C. kindly sent us. This is the first time we have been successful in getting any yield from Soya beans on this farm.

The Cow peas germinated well and we hope to obtain a supply of seed from these which will unable us to plant out a large area very soon.

Beans aught to be an exceedingly valuable crop under present circumstances, but the difficulty of harvesting them unless where labour is plentiful will probably prevent their being grown on any large scale.

EXPERIMENT WITH WHEAT VARIETIES.

First Season.

Variety.	Planted.	Harvested.	Yield per acre.
	1915	1915	
Thew	14th May		Rusted.
White Loaf	,,	6th October.	560 lbs.
Italian Mission Rieti ...	,,		Birds; Late.
Warren	,,	4th October.	652 lbs
Egyptian	,,	Very late.	
,, E.I.A.	,,	Late.	
,, No. 4 ...	,,	2nd October.	Sample.
Indian type 8 ...	,,		Rusted.
,, ,, 17 ...	,,		Rusted.
Pusa No 12... ...	,,		Rusted.
Cross 4	,,	7th Sept.	585 lbs.
,, 4	,,	,,	607 lbs.
,, 4 No. 1 ...	,,	20th Sept	585 lbs.
,, 4 No. 2 ...	,,	,,	607 lbs.
,, 6	,,	,,	832 lbs.
,, 10	,,		Rusted.
,, 10 Short Beard ...	,,		Rusted.
,, 11	,,	20th Sept.	797 lbs.
,, 13	,,	,,	652 lbs.
,, 13 No. 3 ...	,,	,,	797 lbs.
,, 13, 2, 20 ...	,,	,,	900 lbs.
,, 14	,,	,,	530 lbs.
,, 15	,,	,,	675 lbs.
,, 15	,,	,,	607 lbs.
,, 15 A	,,	,,	Sample only.
Thew	22nd April	26th Sept.	470
Equator	17th May	Very late and destroyed by birds.	
Madonna	,,	,,	
Riete and Gluyas ..	,,	,,	
Ushers	,,	,,	
Rieti	,,	,,	
Federation & Rieti ...	17th May	,,	
Persian	,,	,,	
Njoro Selected ...	,,	,,	
Bobs and Rieti ...	,,	,,	
White Loaf	,,	5th October	100 lbs.
Bed 7 x 10	,,	,,	540 lbs.
Type 17	,,	Late	
White Egyptian ..	,,	5th October	670 lbs.
Cross 13	,,	,,	677 lbs.
,, 11	,,	,,	707 lbs.

SECOND SEASON.

Variety.	Planted.	Harvested.	Yield per acre.
Thew	3rd Nov.	23rd Feb	900 lbs.
,, ...	,,	7th March	990 lbs.
Kabete Selected ...	20th Nov.	19th Feb.	450 lbs.
Pusa 12/1	3rd Nov.	19th Feb.	630 lbs.
Cross 4/1	,,	22nd Feb.	787 lbs.
,, 4/3	,,	20th Feb.	697 lbs.
,, 4 4	18th Nov.	24th Feb.	720 lbs.
,, 4/5	3rd Nov.	Late	Rusted
,, 4/6	,,	,,	,,
,, 10/4	,,	,,	,,
,, 10/6	,,	24th Feb.	810 lbs.
,, 10/7	,,	25th Feb.	1,100 lbs.
,, 10/8	,,	25th Feb.	900 lbs.
,, 10/9	,,	23rd Feb.	472 lbs.
,, 11/1	,,	,,	Mixed
,, 11/3	,,	24th Feb.	1,410 lbs.
,, 13/5	,,	23rd Feb.	967 lbs.
,, 14/4	,,		Rusted
,, 15/1	20th Nov.	19th Feb.	845 lbs.
,, 15/3	20th Nov	19th Feb.	540 lbs.
,, 17/2	3rd Nov.	16th Feb.	765 lbs.
,, 15/1	14th Nov.	3rd March	390 lbs.
,, 15/2	,,	,,	210 lbs.
,, 11/2	,,	,,	1,180 lbs,
,, 4/1	,,	,,	550 lbs.
,, 14/3	,,	,,	590 lbs.
Thew	,,	,,	488 lbs.
Cross 11	,,	,,	134 lbs.
,, 11	,,	,,	305 lbs.
,, 10	,,	,,	382 lbs.
Egyptian	,,	,,	327 lbs.
,, 13/2	,,	,,	316 lbs
,, 13/1	,,	,,	376 lbs.
,, 11/1	,,	,,	424 lbs
Cross 11	,,	,,	336 lbs.
,, 10/9	,,	,	304 lbs.
,, 4/4	,,	,,	435 lbs.

Wheat grown during the first season gave a very good sample of grain but had to be protected from the birds. Some plots of the later varieties had to be abandoned from this cause.

Field plots during the second season suffered to a certain extent from the drought but the quality of the grain was high and very little rust was seen.

Seed from these field plots has been distributed this season to various settlers.

Potatoes.—The experiments with potato varieties were continued but the yields in all cases were very small, varying from 15 cwt. to 30 cwt. per acre. New seed has been ordered from home.

Barley.—The Wisconsin pedigree variety continues to give a very good yield. An area planted on the 14th April and harvested on the 13th August yielded 1,980 lbs.

Coffee.—Nine plots of coffee, each $\frac{1}{85}$ acre in extent and containing eight trees each, were laid off and planted in April, 1912. In April, 1915 these plots were manured as follows :—

			Cost per acre. Rs.	Cts.
J	4	No manure.		
K	4	Sulphate of ammonia	42	50
L	4	Superphosphate	10	20
J	5	Sulphate of ammonia and superphosphate	23	80
K	5	Sulphate of ammonia Kainit and Superphosphate	12	75
L	5	Kainit	10	20
J	6	Sulphate of ammonia and Kainit ...	23	80
K	5	Superphosphate and Kainit	10	20

Each of these plots had an application of manure at the rate of $\frac{1}{2}$ lb. per tree. The cost of the manure was that current in April 1915.

A record is being kept of the coffee taken from each tree at the time of picking.

Rotations.—These are being carried on as usual but the results will not be available for several seasons.

Orchard.—A report on the Orchard by Mr. Adams will be found appended.

EXPERIMENTS WITH VARIOUS CROPS.

Paspalum dilatatum continues to grow well and gives a very heavy yield of grass for forage.

Teff Grass.—An area of this grass planted on a field scale on the 19th April yielded 4,320 lbs. of hay and 582 lbs. of seed per acre on the 6th August.

Sugar Cane.—Nearly three tons of Uba Sugar Cane has been disposed of to various people, also an additional area of three acres has been planted out on the farm.

Several West Indian varieties planted in 1914 have also been planted out and canes from these will be available on a larger scale very soon.

Arrowroot.—Quarter of an acre planted on 1st May, 1914, and lifted on 14th February, 1916, gave a yield of 4,312 lbs. per acre.

Chicory.—An area of $\frac{1}{8}$ acre was sown on 5th May, 1915, and harvested on 12th January, 1916. It yielded at the rate of 14 tons, 9 cwts. 0 qrs. 8 lbs. per acre.

Broom Corn.—A certain quantity of seed from this crop has been distributed and I believe that the industry is being taken up on a small commercial scale at Nakuru.

Pests.—Birds were not so numerous this year as last, but cutworm and beetle gave a certain amount of trouble, especially amongst the Tobacco crop.

Clouds of a small brown beetle attacked the young growing shoots of the citrus. These insects were got rid of mostly by smoke fires.

Homestead.—A subsidence occurred in the old dipper. A new dipper was built entirely of concrete and has been giving satisfaction since January.

Labour.—This has been fairly plentiful throughout the year. In January we received 40 Kavirondo youths who are indentured for three years.

General.—Since October, 1915 the farm has become a milk supply depot for the Military Hospitals, and for this purpose a large number of additional cows were received from the Military.

The supply of milk now reaches about 100 gallons per day.

Livestock.—With the exception of casualties due to East Coast Fever, the health of the stock has been good. Sheep have not done well.

The following stock were despatched from the farm during the year:—

Cattle	...	30
Pigs	...	82
Total	...	112

Stock on Hand.—The farm was carrying at the end of the year:—

Cattle	...	566
Sheep	...	54
Horses	...	4
Mules	...	2
Pigs	...	107
Eland	...	3
Total	...	736

Visitors.—The farm has been well patronised as usual.

Staff.—We have been very much understaffed during the year. Mr. W. M. McNaughton, my Assistant was absent on leave from January until August.

Mr. J. D. Ritchie, Clerk, went on leave on 15th April and has been on Active Service since his return to East Africa.

Mr. J. J. Adams, Agricultural Instructor has been fully occupied with Citrus Culture, and has done a considerable amount of travel amongst Settlers.

The late Mr. R. Dedonckele, Flax Instructor, did a lot of very valuable work towards establishing and promoting confidence in the Flax Industry. He was on safari during a great part of the year, and on his return in November he joined the E A M.R. He fell at Manga on 19th January 1916.

A Belgian by birth, Mr. Dedonckele, besides possessing an excellent knowledge of his work had made himself very popular with all who came in touch with him.

It is with sincere regret that I record his loss.

I have the honour to be,
Sir,
Your obedient servant,
(Sd.) JAMES JOHNSTON,
Manager.

ANNUAL REPORT

OF THE

AGRICULTURAL INSTRUCTOR

FOR THE

FINANCIAL YEAR ENDING 31st MARCH, 1916.

DEPARTMENT OF AGRICULTURE,

Kabete, June, 1916.

THE HONOURABLE,

THE DIRECTOR OF AGRICULTURE,

NAIROBI.

SIR,

I have the honour to submit my Annual Report for the year ending March 31st, 1916.

Most of my time during the year has been devoted to raising and budd ng Citrus trees of all kinds. Some 15,000 rough lemon seedlings were planted out in nursery rows two feet by one foot. A number of these were worked with the best named varieties of the Citrus family, namely :—

5,000 Lemon Lisbon Villa Franca, Genoa Eureka :
2,000 Limes-Tahiti.
800 Naval Oranges—Washington Navel—Navelencia and Thompson's Improved :
400 Assorted named varieties of Naartjes :
600 Crape Fruits Marsh's seedless.

These were all the stock large enough to be worked : the others are being done as they get big enough. All the earliest budded stocks grew out very well and were sold during the long rains. The others will be ready for sale at an early date.

Seed Beds.—A number of seed beds were prepared and sown with rough lemon pips. These did well ; some 40,000 to 45,000 seedlings were raised ; 20,000 of which were planted out for budding : the rest will be put out when large enough.

Nursery Experimental Plots.—All sowings, harvestings, etc., were done on all the nursery plots, results of which may be found in the Manager's report.

Orchard.—The citrus trees here continue to carry heavy crops of fruit. The oranges and naartjes are of fine size but lack flavour. The latter may be due to stock influenced, or as there are lemons and oranges planted close together, cross pollination.

The Diciduous Fruit Trees.—Apples and pears are making poor progress but peaches of the sub-tropical varieties, namely: Angel, Waldo, Peen-to, do very well and carry good crops of fruit. Other kinds are a failure so far. Japanese plums still carry fair crops. October purple and Satsuma are the best, while this year Kelsey did fairly well. Apricots did not flower although making good growth. A number of peach stones collected in the orchard were sown and a good percentage came up. These were budded with peaches and Japanese plums and the growth made was very vigorous.

A few Florida Crawford peaches were worked on to the Bitter Almond stocks and these are doing well. This variety gives excellent fruit, and bears quite good crops here, but the trees become partially dormant before the fruit is fully developed with the result, the fruit falls off. This peach and the Shackleford do well in the Nakuru district.

Some Oregon prumes were also worked on Bitter Almond stocks and now are very promising.

Vines.—These continue to be disappointing, although properly pruned, manured and regularly sprayed.

Pineapples, Bananas, Papaws and Loquats all do well.

Disease and Insect Pests.—Young lemon stocks in the nursery were affected by Citrus Psila. This was kept in check by Cooper's V 2 fluid. Two large trees in the orchard had a fungus disease which was completely eradicated by cutting away badly affected shoots and spraying twice with Bordeaux Mixture A one year old Tahiti lime tree which was wholly covered with scale was painted all over with Capex Lime Sulphur wash—40 to 1 Mixture—only one application being necessary to free the tree of this pest.

A small yellow beetle that comes in myriads just after the rains commence does quite a lot of damage to all plants and trees. These insects eat the young growth and leaves of all citrus trees Spraying with arsenate of lead and Paris green was done, but owing to the heavy rains washing this off it was not very effective Capex Lime Surphur was also tried and adhered somewhat better to the leaves, but eventually small fires of weeds and rubbish were lit and great volumes of smoke created, which while clearing the trees did little harm to the beetles.

Spraying for fruit fly in plums and peachs was done with arsenate of lead, once immediately after the fruits were formed, and again when half grown. This had the desired effect, as not one fruit was found when ripe with a maggot in it.

Tours of Inspection and Instruction.—April, 1915 to Charia Bridge.

Several farms were visited where lemons and limes are being budded on an extensive scale, and will be planted out at a later date.

Machakos District.—Here some 50 or 60 acres are planted with lemons doing remarkably well and producing good crops of good sized fruit Small orchards of Navel oranges were also seen, which were very promising, although only recently planted.

Ulu—visited in May.—An orchard of Japanese plums and assorted deciduous fruit trees was looking very healthy and making good growth.

Nakuru and Lower Mole Districts visited in June.—Most of the farmers interested in Citrus culture were visited. Several of them had nurseries of rough lemons: some budded and others being worked. A large acreage will be planted in the near future.

Uasin Gishu—protracted tour in September, October and November.—During a tour of 63 days duration visits were made to nearly all the farmers, especially those interested in the Citrus Industry. Throughout I found a few trees planted for household use and these looked very promising indeed.

Nurseries of rough lemon stocks are being grown for working with better varieties, and a large acreage of lemons and limes will be planted as the trees become ready.

In all districts visited, instruction on budding stocks for use, sites for planting, pruning, sizes of holes, depth to plant, etc., were given. A detailed report of this tour was sent to Head-quarters on my return.

During this tour I impressed on all planters of fruit trees, and especially on planters of citrus trees the necessity of not planting too deep. Planting too deep has generally been made wherever I have visited. It must be remembered when digging a hole, say 3 ft. by 2 ft. that, although the top roots may be kept level with the surface when setting out, the soil when it settles again will probably drop 2 to 4 inches; therefore the collar or top roots should be kept that height above the surrounding level of ground. It is better to have small trees high than buried, as Mal-di-Gomma or root rot will surely attack the trees sooner or later.

Some trees seen in various districts visited were very badly affected with Aspidiotus aurantii Citrus Red Scale. This insect is most difficult to contend with, and planters should only purchase trees from nurseries that have passed the inspection of the Government Entomologist in countries where they are grown. With young small trees, painting the whole of the trees, leaves, etc., with resin wash, while with large trees, fumigation with Hydrocyanic Acid Gas, are the only remedies.

Several of the Reformatory boys here are being taught budding, pruning and General fruit tree culture. Also a number of settlers boys have been taught from time to time; and letters expressing satisfactory results of boys taught, have been received from the settlers.

The number of Citrus trees sold during the year, including Oranges Lemons, Limes, Naartjes and Grape fruit was 4,938. Of rough lemon stock sold there were 9,700.

I have the honour to be,

Sir,

Your obedient servant,

(Sd.) J. J. ADAMS,

Agricultural Instructor.

ANNUAL REPORT

OF THE

TOBACCO DIVISION

FOR THE

YEAR ENDING 31st MARCH, 1916.

DEPARTMENT OF AGRICULTURE,
TOBACCO DIVISION,
Kabete, 1st April, 1916.

TO THE HONOURABLE,
THE DIRECTOR OF AGRICULTURE,
Nairobi.

SIR,

I have the honour to submit the annual report of the Tobacco Division for the year ending March 31st, 1916.

During the year my time was spent as follows:—182 days at Kabete, 13 days at the Head-Office, Nairobi.

Safaris, &c.—21 days safari at Lukenia, 2 days safari to Ulu, 2 days safari to Muhoroni, 2 days to Njoro, 3 days to Naivasha, 1 day Nakuru, 7 days Lamu, 1 day at Malindi and 2 days at Mombasa. These days were employed in the work of my Division.

Adviser seconded for other duties.—I also spent 18 days at the Head-Office and 16 days at Naivasha employed in Departmental work not in connection with tobacco; and I was seconded to the Department of Registration of Documents for 96 days.

In the absence of the Entomologist I conducted the experiment in the production of Eri silk at Kabete during the month of March.

Mr. J. Johnston kindly supervised the manufacture of native snuff at Kabete, during the time I was absent on other duties.

Owing to the unsettled state of the country, only a limited number of tobacco trials were undertaken. Particulars of these are now given:—

(1) GOVERNMENT FARM, KABETE.

Plots 1915.—Five acres of tobacco (10 varieties) were planted out in the April rains: the plots were:—

Plot 1. Havana: ¼ acre.—Yield of cured leaf 126 lbs. This delicate tobacco did not grow out very well. It probably requires an evener temperature and more moisture. The leaf was air cured, and subsequently an attempt was made to sweat it in a large packing case. The result was not highly satisfactory.

Plot 2. Comstock Spanish: ¼ acre.—Yield of cured leaf 273 lbs. This robust cigar tobacco grew fairly well. The leaf was air cured with fairly satisfactory results and afterwards sweated. A much better sweat was obtained than in the case of the Havana mentioned above.

Plot 3. Zimmers Spanish ¼ acre.—Yield of cured leaf 200 lbs. A similar tobacco to that on the last plot. The results of the trial were much the same but the yield was smaller. Both this and plot No. 2 suffered from white mildew, as the affected leaves were destroyed the yields were reduced.

Plot 4. Connecticut Seed Leaf ¼ acre.—Yield cured leaf 43 lbs.. Trial a failure.

Plot 5. White Burley: ½ acre.—Yield of cured leaf 122 lbs. Trial a failure. As this makes the fourth time this variety has been tried at Kabete, it is evident the local conditions are unfavourable.

Plot 6. Sterling Bright ½ acre.—Yield of cured leaf 362 lbs. The third season at Kabete Part of this plot was manured with farm manure. The result was an increased crop of handsome leaf. This variety is one that grows well at Kabete. The leaf, when sweated in heaps, and air or sun cured shows some nice browns; but the texture is somewhat poor, and body is lacking. The flavour is strong. It does not flue cure well.

All the above plots were after fallow.

Plot 7. Sterling Bright: ½ acre.—Yield of cured leaf 300 lbs. The crop did not grow out so well as the same variety on plot 6 under different conditions.

Plot 8. Yellow Prior: ½ acre.—Yield of cured leaf 150 lbs.

Plot 9. Raglands Conqueror: ½ acre:—Yield of cured leaf 192 lbs.

Above three plots were after linseed.

Plot 10. Raglands Conqueror: ½ acre.—Yield of cured leaf 172 lbs.

Plot 11. Hestor: ½ acre.—Yield of cured leaf 158 lbs.

Plot 12. Kentucky Yellow: ½ acre.—Yield of cured leaf 120 lbs.

Above three plots were after Broom Corn.

Plots 8, 9, 10, 11 and 12 were planted to ascertain if a bright tobacco suitable for flue-curing could be grown at Kabete if the ground had been previously severely cropped by various rotations. The result was a failure: and these trials would seem to show conclusively that these tobaccos are unprofitable at Kabete.

Unfortunately some of the cigar tobacco leaf became mouldy during the short rains when I was absent on other duties.

Samples to be sent to England.—It is proposed to send samples of the most promising leaf to the Imperial Institute for report as soon as possible.

Seed.—Seed has again been selected from the best varieties and is ready for distribution.

Cutting Machine.—A machine for cutting matured leaf has been purchased and is available for the use of Settlers who wish their leaf to be cut at the Farm. The Machine is too heavy to be sent on loan. Several planters have been glad to make use of the machine.

Sales.—4,050 lbs. Tobacco leaf was sold, realising £48.

Snuff Manufacture.—200 lbs. native snuff was manufactured and sold, realising £10. In addition the tobacco of those who wished to present native snuff to His Majesty's Troops was manufactured at cost price.

Trials 1916.—Seed beds have been sown and it is proposed to plant out seedlings of the undermentioned varieties in the coming rains:—

1. Zimmers Spanish. } Cigar Tobaccos, which grew well in
2. Comstock „ } 1915.
3. Bonanza. A hybrid American Tobacco.
4. Indian Tobacco obtained from the Agricultural Research Institute, Pusa. Bihar.
5. Sterling Bright. A further trial of the acclimatized seed.

(2) LUKENIA SYNDICATE'S ESTATE, LUKENIA.

Mr. F. B. Hill, Lukenia, carried out this trial in conjunction with the Department. The soil chosen was of a light sandy nature, which retains the moisture to a much greater extent than is usually the case with soils of this Protectorate. This fact had, in my opinion, a marked effect on the growth of the crop, the total rainfall during the Tobacco season being only 11·22 inches, which is not sufficient in ordinary circumstances to produce good growth.

The results of the trial were, however, quite satisfactory, a good proportion of nice bright leaf being produced. This is the best sample of bright leaf I have yet seen in the Protectorate, and I have great hopes that when it is possible to forward it to England the report of the experts will be favourable.

It is quite certain that in a season of greater rainfall the crop would be even better.

Acreage.—Commencing on 28th March, 9 acres were planted out with "Goldfinder" and "Ragland's Conqueror," but owing to the unsatisfactory rainfall a stand of only about 7 acres was obtained.

Curing.—Reaping was begun on 1st July, part of the crop being flue cured and the remainder sun or air cured. The best bright leaf was obtained by flue curing.

Cost of Production.—Mr. Hill informs me that the crop averaged 600 lbs. per acre, and the cost of production viz., seed beds, preparing land, planting, cultivating, spraying, reaping and curing was Rs. 120 per acre or 20 cents per lb. cured leaf.

Part of the expense of this trial was borne by the Department.

Conclusions.—The experiment has proved that bright tobacco can be grown on the sand soils of the Machakos District, and it is to be hoped further trials will be made after the War.

(3) MALINDI.

Mr. J. E. Jones kindly supervised a small Government trial at Malindi.

Seed Beds.—Considerable difficulty was found in raising seedlings, further experience of how the Coast climate affects tobacco would doubtless provide a solution.

Varieties. Tried.—The following varieties were planted out:—

Yaka	230	plants.
Conqueror	87	,,
Goldfinder	102	,,
Turkish	52	,,
Havana	22	,,
Sumatra	18	,,
Zimmers Spanish	33	,,
Cuban	27	,,

Curing.—All the leaf reaped was sun cured in the daytime and placed in a shed at night, the only method of curing which was available.

Samples.—Samples of the cured leaf have arrived at Kabete and will be sorted out, as soon as opportunity offers, for submission to the Imperial Institute for report thereon.

Seed.—Mr. Jones carefully harvested seed from the best plants which seed is now available for distribution.

Conclusions.—The trial though not on a commercial scale, has had promising results and should be continued when possible.

(4) LORD KITCHENER'S ESTATE SONGHOR MUHORONI.

Unfortunately the rains failed and the trial had to be abandoned.

I have the honour to be,

Sir,

Your obedient servant,

(Sd.) CHRIS J. MONSON,

Adviser for Tobacco.

ANNUAL REPORT

OF THE

MYCOLOGIST

FOR THE

YEAR ENDING 31st MARCH, 1916

AGRICULTURAL DEPARTMENT,
Nairobi, June, 1916.

THE HONOURABLE,
DIRECTOR OF AGRICULTURE,
NAIROBI.

SIR,

I have the honour to submit my annual report for the year ending March, 31st 1916.

1. General.—During the Entomologist's absence on leave and again recently I have in collaboration with the Director of Agriculture and the Coffee Plantation Inspector attended to enquiries on entomological subjects, dealing with coffee, maize, wattle, roses, and locusts. In this connection I proceeded to Kijabi in June 1915 and examined the north end of the Kedong Valley for possible egg-laying locusts. None, however, were found, nor was it considered likely that locusts would lay in such a spot, preferring as they do sandy and arid regions.

In July 1915 I proceeded to the Government Farm at Kibos to carry out some spraying experiments on coffee leaf disease: but as these experiments are still in progress no detailed account is given here: (see under coffee in this report).

In November 1915 I was granted 3 months leave for Military duty, but as the Authorities were unwilling to accept so short a term of service I was seconded to the General Post-Office and relieved the Assistant Chief Accountant of certain routine work thus enabling him to go to the front. I returned to the Agricultural Department in February 1916 in time for the harvest of the experimental wheats at Kabete.

In connection with the office and laboratory work a series of the experimental wheats grown at Kabete were set up in the museum of the Department. These comprised tubes of grain placed next to ripe ears of the same wheats in alternating rows and arranged so as to show the different types arising from any one particular cross.

A case was also set up showing the various smuts and rusts on cereals which occur in this country.

During the year a number enquiries and specimens of diseased plants were received and dealth with. These oncerned citrus, coffee, rape, lucerne, tomatoes, vegetable marrows, roses, tobacco, peaches and strawberries.

The following diseases not hitherto recorded were observed and dealt with :—

Leaf and stem rot of tomatoes.		due to	Ascochyta citrulina.
Rose leaf blotch	...	,,	Actinonema rosae
Rust on Lucerne leaves	...	,,	Uromyces pisi.
Strawberry leaf spot	...	,,	Mycosphaerella fragariae.
Loose smut of wheat	...	,,	Ustillage tritici.
Flax rust	...	,,	Melampsora lini.
Saprophytic fungus on fallen citrus fruit		,,	Penicilium italicum

2. Wheat.—Considerable progress has bsen made during the two seasons under review, namely, the long season May to Oct. and the short season October to February, both as regards the growing of greater quantities of wheat and also the distribution of the same to settlers.

As the quantities of grain from nursery plots have increased, more wheat has been sown in field plots in areas ranging from 1/10th to 5 acres. In October 1915 besides the wheats in the breeding cage and some 70 plots in the nursery there were some 8 acres in the field.

The object of obtaining a wheat highly resistant to rust has been attained so far as the Kabete district is concerned, and there are now some 30 selections derived from crosses made some four years ago, which during these years have proved highly resistant to rust.

Of the three rusts which occur on wheat in this country, the black or stem rust (Puccinia graminis) is by far the worst, attacking as it does, ears, leaves and stem, particularly the latter. The brown rust (Puccinia triticina) occurs only on the leaves but can bring about great havoc in a wet season. The yellow rust (Puccinia glumarum) is not so common except on Egyptian wheats, which however are resistant to black rust.

From the hybrid wheat derived from crossing "Nut Cut" and Egyptian No. 3 a selection was obtained highly resistant to both black and yellow rests, and from the highbrid which was short bearded selections have been made differing in colour of chaff and grain. At present there are some five pure types obtained from this hybrid all short bearded and resistant to the yellow and black rusts but differing slightly in other respects.

A most encouraging report was received from the local Millers on the milling and baking qualities of one of these selections, and as the others increase in quantity they will be submitted to similar tests.

The work of the year during the two seasons has been to select further types from the rust resistant varieties, and attention has been fixed upon such characters as awnless, bearded and short bearded ears, red and white chaff, red and white grain, grey and green colouration of the foliage. These have been separated on Mendelian lines, from the cultures of resistant wheats in which all these characters appeared together as the result of crossing.

In all some 40 varieties and selections were grown with most promising results, and of these ten were pure strains originating from Canada, Australia and France.

Besides the hybrid "Nut-cut" and Egyptian No. 3, other successful types differing in colour of grain, chaff and foliage were derived from such crosses as Early Rieti and Thew, Rieti and Red Fife, Egyptian No. 3 and Thew. Most of the selections chosen from these were beardless or short bearded and a few both bearded and awnless. Towards the end of 1915 three new soft wheats were obtained from France and one hard variety from Canada, and these will form the parents of new hybrids with such resistant strains as Rieti and Egyptian No. 3.

In February and March 1916 a number of samples of hybrid wheats produced at Kabete were distributed free to settlers on the Uasin Gishu Plateau, Nakuru, West Kenia and the Plains below Nairobi. The samples 12 in number varied from 30 lbs. to 3 lbs. in weight, and it is confidently expected that some of these at least will do well in each of the new districts.

The results of the distribution of 12 samples of selected wheat grown on Lord Delamere's Estate at Njoro were encouraging, particularly in the West Kenia and Uasin Gishu areas.

The grain store at Kabete has been properly equipped with tins and drums for containing the smaller quantities of wheats and by employing these it was found possible to keep seed wheat quite free from the grain wevil and moth by means of flaked naphthaline.

The experiments carried on with the rotation of flax and wheat again emphasised the fact that a wheat like Thew, susceptible to rust is not attacked so badly when grown upon soil which has previously borne flax.

This is probably because the flax removes a large amount of nitrogen from the soil, and it is the presence of this element which according to recent experiments at Cambridge is one of the causes of susceptibility to rust in wheat.

3. Coffee.—In the early part of 1915 spraying experiments were again carried out on the Coffee at the Asylum, half an acre being sprayed with quarter strength liver of sulphur and another half acre with quarter strength Bordeaux mixture. Owing to the War, however, spraying with the former had to be discontinued as liver of sulphur being a potash salt become unobtainable.

It was found un-necessary to spray the coffee in the Botanic Garden which had not been attacked with leaf disease since October 1914.

The results of the work on *Hemeleia vastatrix* so far show, that for the Nairobi-Kyambu area sound cultivation with pruning and one or two applications of any dilute fungicide serve to completely check the disease. Once mastered, cultivation, pruning and only one spraying a year are sufficient to keep the parasite well under control. Great stress is laid however, on the condition that plantations must be kept clear of weeds and thoroughly pruned once a year.

With coffee at lower altitudes, such as that at the Government Farm, Kibos, it was found that the quarter strength mixtures were of little or no use in combating *Hemeleia vastatrix*. This is probably due to the lower (3—4000 ft.) altitude with consequent warmer and moister climatic conditions which are much more favourable to the spread of the disease. In this connection experiments have been arranged in which a more concentrated spraying mixture will be used and it is thought that a concentrated "carbride" mixture may effectively control the spread of the parasite.

In the absence of the Entomologist Mr. Trench and myself inspected some plantations in connection with the ravages of the coffee bug (Antestia varigata) and sections of the young berries were prepared and exhibited showing the damage caused by this insect. Similar work was also carried out with regard to the thrips which causes a good deal of damage in the droughts.

During the year a pamphlet was prepared giving the results and particularly the methods of making up various spraying mixtures used in my experiments on *Hemeleia vastatrix* and some other fungous parasites which are found on coffee.

4. Citrus.—The citrus (lime, lemon and orange) trees suffering from the "nail head" and "wither tip" fungi which were sprayed early in 1915 with Bordeaux mixture (full strength) and lime sulphur wash (ordinary formula), (see last years report), showed marked improvement after the long rains of 1915. It was recommended that the treatment with lime sulphur should be continued before the short rains in November.

Similar cases of these diseases occurring on the Government Farm, Kabete, yielded to treatment with Bordeaux mixture The spraying operations were in these cases carried out effectively by Mr. J. J. Adams of the Farm Staff.

5. Botanic Gardens.—During the year the work of clearing the new gardens of gum, rubber and other useless trees was practically completed. The small patch of native forest was judiciously thinned out and the cleared areas for the most part were put under *Cynodon dactylon* grass.

Early in 1916 the Director of Agriculture, Mr. Powell and myself decided upon a scheme of laying out an attractive garden. A road was marked out and cut from a new entrance in the Ngara Road to traverse in large curves the patch of native forest and finally to join up with the existing main road which runs straight from the entrance of Ainsworth Hill to the far side.

About a hundred seedlings of choice exotic trees and shrubs in lots of 12 each were obtained from the Forestry Department and planted in groups of six on the cleared areas of the garden.

The labour during the year was rather erratic and for the first half of the year was composed of some 15 convicts; later, however, these were raised to 20 and supplemented by a gang of natives kindly lent by the Carrier Corps. These varied from 70 to 20 in number and came rather irregularly but did excellent work in clearing weeds and grass.

It is to he hoped, however, that some provisions will be made for a permanent gang of labourers to reside at the gardens under the supervision of a head-man, much in the same way as the Arboretum is worked by the Forestry Department. It has been impossible to supervise thoroughly the labour owing to the calls of ordinary work and of that in connection with the sowing and the harvesting of the experimental wheats, and also of occasional safaris which have taken one away from head-quarters for an indefinite time.

On the whole great progress has been made, but it will become necessary in the near future for some European Official to reside at the gardens in order to personally supervise the work if an attractive and useful Botanic and Pleasure Garden is to result.

I have the honour to be,
Sir,
Your obedient servant,
W. J. DOWSON.

ANNUAL REPORT

OF THE

COFFEE PLANT INSPECTOR

FOR THE

YEAR ENDING 31st MARCH, 1916

DEPARTMENT OF AGRICULTURE,
Nairobi, 1st April, 1916.

THE HONOURABLE,
THE DIRECTOR OF AGRICULTURE,
NAIROBI.

SIR,

I have the honour to herewith submit my report for the year ending March 31st, 1916.

From April 1st, 1915 to 31st March, 1916, I made 177 visits, divided as follows :—

Summary of visits from April 1st, 1915 to March 31st, 1916.

District.	Total No. of Visits.	Total Acreages.	Acreages 1 to 3 Years.	Acreages 3 to 6 Years.	Acreages over 6 Years.	Second Visits.	Places not previously visited.	Acreages.
Kyambu	79	4,565	3,617	644	304	18	37	2,537
Thika	20	1,770	1,689	81	...	3	15	1,142
Nyeri	23	629	501	126	2	8	15	629
Limoru	12	296	249	29	18	...	9	161
Ngong	3	490	440	50	...	...	2	230
Lumbwa	5	116	116	...	...	...	...	...
Kericho	9	92	87	5	...	2	...	...
Fort Ternan	7	275	275	...	...	2	2	60
Koru	11	619	514	100	5	2	2	50
Songhor	8	406	402	4	...	1	...	...
Ten districts	177	9,258	7,890	1,039	329	36	82	4,809

Number of visits made to plantations whose owners or managers were on military duties.

Kyambu	... 30	Lumbwa	... 4	
Thika	... 10	Kericho	... 5	
Nyeri	... 10	Fort Ternan	... 3	Total 80.
Limoru	... 8	Koru	... 6	
Ngong	... 1	Songhor	... 3	

Of these 177 visits, 80 were made in consequence of the owner or managers being absent on military duty.

I was pleased to see that all these farms were being well and carefully looked after by those in charge.

Kyambu.—There are still a few plantations in Kyambu which I have not yet visited. Quite two thirds of the entire acreage under coffee is in this district, and this acreage has increased considerably during the past year.

The Cut-worm damage has not been as serious as heretofore, as planters have been taking more precautions against it; viz.; searching for the grubs, setting poisoned bait, and wrapping shields round the stems of the young plants.

Thika.—Here the acreage put under coffee has also greatly increased, and the plantations are nearly all over 100 acres in extent.

Nyeri.—In July 1915 I made my first visit to the Nyeri district. Although the rainfall here is somewhat less than that in Kyambu, I found the average berry larger than in the other coffee districts; this may be accounted for by the climate being more misty. The trees make comparatively slow growth, but develop into fine specimens and yield good crops; this slow growth seems to me to be rather an advantage than otherwise.

I found one patch infected with Hemeleia vastatrix. This patch I advised having destroyed, which was at once done, the trees being cut out and burnt. Later on my next visit, in December 1915, I found that a neighbouring plantation was slightly infected, these trees were pruned and sprayed.

Limoru.—In February 1916 I made my first complete tour of the Limoru district. At the lower elevations (up to 6,600 feet) coffee does well, but higher than this, growth is very slow and the berries small; the climate is cold enough to injure crops planted in valleys.

Ngong.—The coffee in this district is doing fairly well, but the growth is much slower than in Kyambu.

Kericho.—The plantations on the whole are progressing favourably though growth is slow in this district, and the prevalence of hail storms is certainly a drawback. The present system of moderate shading is proving satisfactory.

Fort Ternan.—In February 1916 I found three neglected plantations in this district, and reported the matter. The Department has requested the owners to put them in good order.

Koru.—In the Koru District, I regret to say that on my last visit, in February 1916, I discovered that two plantations were infected with Hemeleia vastatrix. They were in a poor state of cultivation, and the Department ordered that they should be cleaned, pruned and sprayed. The coffee is doing remarkably well in this district.

Songhor.—Some slight damage is done here, as well as in the adjacent districts, by hail.

In both this district and Lumbwa the coffee is doing excellently.

Patches of Government Coffee in Nairobi.—The plots of coffee at the Asylum and at Dr. Van Someren's, of which the Mycologist and I took charge in 1915, have been kept cleaned and pruned and Mr. Dowson carried out spraying experiments to check Hemeleia vastatrix.

During 1915 I manured the plots with Safalga Bay Phosphates.

I cannot say exactly what effect the phosphates had on the trees but the combined treatment of cleaning, pruning, spraying, and manuring, has resulted in very fine growth of new wood; and the trees, which are now in excellent condition, have on a very good blossom.

In May 1915 some few plantations in Kyambu were partly manured with Safalga Bay Phosphates: up to the present, I have noticed no difference between the manured trees and those in the same field which received no manure. But, as these phosphates dissolve very slowly, and are thus of slow action, it is not possible to say yet whether they will prove of definite benefit to the coffee or not.

Thrips.—On my return, in April 1915, from a safari to Sotik, I found that a "new pest" had broken out in the coffee in the Nairobi and Kyambu districts. On examination this proved to be a species of Thrips, which pest had not previously been known to attack coffee. It caused considerable damage in parts of Kyambu, the trees most severely affected loosing their secondaries and tertiaries and part of their primaries In these cases I advised heavy pruning, to give the trees a chance to recover, and to check the dying back I carried out various spraying experiments to combat the disease; and have come to the conclusion that a solution of (common) soap and water (5 lbs. soap to 40 gals. water), has the best effect on it.

With the advent of the rains, the insects gradually disappeared, and, in most cases, the trees recovered and are now making good growth In January 1916 another outbreak was reported; in some places in the same fields as the previous one, though where it had been most severe in 1915, trees were not again attacked. I spent a week on Messrs. Coldham and Bentley's plantation, in Kiambu, carrying out spraying treatments. The solution referred to above killed the insects, but apparently not the eggs, as 4 days after the application the pest was nearly as bad as ever. However, after a second and third spraying it all practically disappeared and neither trees nor crop suffered to any extent.

Unfortunately, Thrips feeds not only on the leaves and young twigs, but also on the blossoms and berries: and these berries, and, indeed, those off any trees attacked, yield a very poor thin bean and sometimes none at all. This seriously affects the value of the crop from an infected field. Blossoms attacked do not mature. I consider that if an infection be discovered and treated early, small damage will be done Constant watchfulness, especially in very dry weather, should prevent the loss of crop consequent on the ravages of this pest.

In the Muhoroni districts some of the insects were found, but in such small numbers as to cause no material damage. I attribute this to the greater rainfall in these districts, as rain has the effect of checking the increase of the insects.

The trees which were badly affected and which had to be heavily pruned, in some cases even lopped, have now put on good new wood.

In the middle of 1915, an outbreak of Hemeleia vastatrix was reported at the Government Farm at Kibos.

Mr. Dowson gave the Manager instructions as to spraying treatmeut for it.

I have no fear of Hemeleia ever becoming a serious drawback to coffee growing in this country. Particularly in Kyambu, the tree seems to have a marvellously rapid power of recuperation after an attack, especially where the fields have been kept in through planter-like order. Plantations which I saw, two years ago, badly infected, are now in excellent condition and are bearing good crops. Of course due precautions should be observed, such as keeping the trees clean and well pruned, and, should an outbreak occur, spraying them thoroughly is considered advisable.

I am glad to see great improvement in the treatment of plantations; more especially in the pruning of both young and old trees. Now that most of the planters have tried pruning their trees and stopping them at lower heights, they begin to perceive the benefit of this work, and the advantage both to trees and crop.

There are still some districts which I have not yet had time to visit, such as Uasin Gishu, Nandi, and Machakos: and others to which I have not been able to pay a second visit, Nakuru, Solai, Sotik and Kibos.

Part of my time during the last year has been taken up in compiling a pamphlet on coffee growing and manufacturing in this country, which pamphlet will, I hope, shortly be sent to press.

I have the honour to be,

Sir,

Your obedient servant.

(Sd.) M D. C. POER TRENCH,

Coffee Plant Inspector.

ANNUAL REPORT

OF THE

VETERINARY DEPARTMENT

FOR THE

YEAR ENDING 31st MARCH, 1916.

OFFICE OF THE CHIEF VETERINARY OFFICER,

Nairobi, March 31st, 1916.

The following constituted the staff of the Veterinary Department during the year 1915-1916.

Chief Veterinary Officer	...	R. J. STORDY.
Deputy Chief Veterinary Officer	...	W. KENNEDY.
Veterinary Pathologist	...	R. E. MONTGOMERY.
Veterinary Officers	...	R. EDMONDSON.
		A. G. DOHERTY.
		H. H. BRASSEY-EDWARDS.
		F. J. McCALL.
		O. DIXON.
		R. C. WHEELER
		W. W. HENDERSON.
		G. N. HALL.
		F. J. S. SHEEDY.
		A. W. CARTER.
		T. C. BRADSHAW.
		M. H. REID.
Assistant Veterinary Pathologist.		W. KEARNEY.
Permit Officer	...	J. B. BANKS.
Clerks	...	A. WALKER.
		J. W. JOHNSON.
Livestock Inspectors		H. G. ULYATE.
		R F. RYAN.
		J. McCLYMONT.
		H. BRANWHITE
Indian Veterinary Assistants	...	GHULAM HASSAN SHAH.
		KARAM ELLAHIE.
		KHALILUR RAHMAN KHAN.
		MOHAMED RAMZAN.

The following Officers proceeded on leave during the year :—

A G. Doherty on May 7th, 1915.

R. C. Wheeler on July 18th, 1915.

J. McClymont on March 1st, 1916.

The following Officers returned from leave :—

The Chief Veterinary Officer on April 15th, 1915.

A. G. Doherty on August 14th, 1915.

R. C. Wheeler on February 17th, 1916.

Stock Inspector, R. F. Ryan was dismissed the Service on November 23rd, 1915.

Stock Inspector, H. Branwhite arrived on first appointment on November 20th, 1915.

Mr. G. D. Ball was engaged as tempoiary Stock Inspector for special work on the Uasin Gishu Plateau in connection with Ulcerative Lymphangitis of Equines. He was appointed on January 1st, 1915 and his services terminated on September 28th, 1915.

Mr J. Kempe was engaged as temporary Stock Inspector for the Uasin Gishu Plateau on October 4th, 1915.

Both the above underwent a course of tuition at the Laboratory before taking up their duties.

Indian Veterinary Assistant Karam Ellahie left the Service on November 27th, 1915 in order to take up a post as Assistant Professor in the Veterinary College, Lahore, India.

DISEASE OF CATTLE.

East Coast Fever.—Fresh outbreaks of East Coast Fever have occurred on several farms on the Uasin Gishu Plateau. A Veterinary survey was carried out there, in July and August 1915, and it was found that, owing to the shortage of immume transport oxen caused by the Military requirements having demanded the purchase of this type of animal, it was impossible to enforce strict quarantine measures as it was necessary, to avoid grave hardship to maintain transport in the district. There are a good number of dipping tanks already erected on the Plataeu, and more are being built, so that it is hoped, that it will soon be possible for all animals on the Plataeu to be regularly dipped.

Since the War began, there is evidence that East Coast Fever has spread in the settled areas, and in many cases this can only be attributed to the illicit movement of cattle from infected native reserves, such movement having been stimulated by the shortage of work oxen caused by the War.

As a result of the heavy mortality recorded amongst cattle, drawn from native reserves, collected at various military supply centres, it is evident, that in the so called infected reserves there must be large areas where the disease is non-existent. This only emphasizes the necessity for erecting dipping tanks in these reserves, to check the spreadof the disease, and to safeguard the clean herds.

During the year Government dipping tanks have been completed at Nairobi, and at Rumuruti, and a tank has been erected by the Military Authorities at Fort Ternan. Several private dipping tanks have also been erected, and some 80 are now in use in the Protectorate.

It has been noticed on several farms where "redlegged" ticks are prevalent, that those situated inside the ears frequently survive an immersion in the dipping fluid, and the attention of stock owners is drawn to the necessity for frequently dressing the inside of the ears of cattle infested with these ticks with a mixture of lard and Stockholm tar, in order to get rid of them.

When dipping operations are commenced on heavily infected farms in this country it has been found that a considerable mortality occurs amongst susceptible stock during the first year. This experience is similar to what has been found to occur in Rhodesia, and differs from that of stock owners in South Africa.

The number of cattle, the property of Settlers, admited to the East Coast Fever Testing Area at Kamiti during the year was 587. The number of deaths was 24.

Seventeen adult oxen drawn from the Uasin Gishu Masai Reserve were tested during the year, and all of them proved to be resistant to the disease.

The following extract from the Government Analyst's report is of considerable interest :—

During the year 1915, the number of samples of cattle dip analysed and reported upon was 650 against 480 in 1914. The results show no improvement upon those of the previous year as will be seen from the following table.

Percentage Error.	Percentage of Samples.	
	1914.	1915.
0—10	61·4	54·5
11—20	20·6	25 7
21—30	9 2	10·3
31—40	4·0	3 8
41—50	1·5	2·6
Greater than 50	3·3	3·1
Sufficiently correct...	61·4	54·5
Dangerously incorrect	18·0	19·8

It was anticipated that, with more experience, the dip owners would improve upon their record of 1914 in the matter of maintaining their dips approximately correct, but it is apparent from the above comparison that in reality there has been a slight falling off in the skill displayed. Probably the fact that many of the Settlers have left their farms in order to do Military service is quite sufficient explanation and, from this point of view, it is satisfactory that the results are so near to those of the previous year.

The analytical control of numerous cattle dips in the country has not yet resolved itself into a system. It has been left to the discretion of the owner, how frequently he shall have an analysis made, so that it has happened that whereas some owners have only once or twice submitted samples for analysis others again have sent in up to 32 samples in the year.

It sufficiently appears from the preceding classification of samples according to the magnitude of their error in strength that considerable improvement should be made in the direction of maintaining dips in a state of efficiency. It is very obvious, from a consideration of the record of individual dips, that the owners are frequently working in the dark as to the capacity of the dip and hence cannot make necessary corrections when they have been informed of their error. The consequence of this is that they immediately send a fresh sample in order to ascertain how far their attempt at correction has succeeded.

The analysis of arsenical dips costs time and money, and this method of obtaining analysis after very correction, instead of relying upon exact calculations of volume of the dip and accurate measurement of the material added, is taking a grossly unfair advantage of the privilage of free analysis which has so far been afforded the dip owners. It has been conclusively proved that this method of correction by trial, instead of by calculation, is not only expensive to the State, but is also unsuccessful.

Steps are being taken to encourage the dip owner to acquire an intimate knowledge of the capacity of his dip, and to take a lively interest in the accurate measurement of all intentional and accidental additions and substractions, and to discourage him from attempting to place upon the State the burden of maintaining his dip efficient.

Attention in previous reports has been drawn to the changes in composition which dips undergo, particularly to the processes of oxidation and reduction.

There appears to have been about 76 dips under observation during the year—the exact number is doubtful as samples from the same dip are sometimes sent over different signatures and the tracing of these is difficult—and in 47 of these the oxidation has not been very great, the quantity of arsenate formed not having at any time exceeded 25 per cent. of the amount of arsenite present. In 18 dips the arsenate reached a maximum exceeding 25 per cent. but not exceeding

50 per cent. of the arsenite, and in all dips a maximum of arsenate exceeding 50 per cent. was reached. In one case oxidation proceeded so far that there was actually at one period over 2½ times as much arsenate as arsenite present. The cycle of oxidation and reduction was in one case completed twice in the year, in two cases it took approximately nine months; several cases indicated a complete cycle in about 12 months, while in many cases the course of the changes was irregular, and the oxidation did not steadily proceed to a maximum followed by a continuous reduction.

It has occurred in many cases that a dip has been kept in use long after it has become filthy and thick with dung and mud. There are not lacking indications that these dirty dips are inefficient, even when the analysis indicates a satisfactory arsenic content.

It is highly probable that compounds of iron with arsenic are formed which have practically no toxic properties. Perhaps further experience will enable a more definite statement to be made as to the amount of mud, etc., which may be tolerated. Several cases of error in sampling have occurred—tins which have been used for measuring out Coopers dipping Fluid have been immediately afterwards used to take a sample from the dip; bottles with a quantity of rinsing water left in have been filled up with the sample, etc. Cases have occurred where the results of analysis have given great surprise to the dip owners, and explanations have been demanded of the Analyst. In these cases the usual sources of error in sampling have been pointed out, and the owner has sometimes recognised one or other as the probable explanation, in other cases no explanation has been forthcoming excepting that some serious miscalculation has been made in making up the dip.

Rinderpest.—Outbreaks of this disease occurred during the year in the settled areas of Lumbwa, Molo, Londiani, Njoro, Nakuru, Naivasha, Kedong, Ngong, Nairobi, Thika and Machakos. In suppressing these outbreaks the double inoculation method was used at Molo, Nairobi, Thika and Machakos. The other outbreaks were dealt with by the inoculation of serum only. The mortality from double inoculation has proved to be as small as in previous years and there is no doubt that this is the best method for dealing with the disease in this country, owing to the constant danger of the disease being reintroduced from infected native reserves, or through the migration of infected wild game.

In September 1915, the Veterinary Pathologist reported that instances had come under his notice which went to prove that the double inoculation of calves under six months old did not always result in the production of a permanent immunity to Rinderpest. A circular letter was therefore issued to all Veterinary Officers informing them that calves which are double inoculated for rinderpest when under the age of six months should not be considered immune and consequently should not be branded A M (this brand signifying active immunity). At a later period when such calves are over six months old they should be again double inoculated and branded as immune.

A fresh outbreak of Rinderpest occurred amongst the cattle of the Samburu tribe, Nothern Forntier District. A temporary quarantine station was therefore formed at Archer's Post and all trade cattle, awaiting release there, were injected with serum and passed on to Rumuruti Quarantine Station where they were again serumed before being passed on to the settled areas.

At the Fort Ternan Quarantine Station 1367 Military cattle and 2,328 cattle, the property of settlers and traders, were double inoculated during the year.

The Laboratory issued the following quantities of serum during the year.

To Military Authorities, East Africa ...	42,352
,, ,, Uganda	10,080
Veterinary Department, E.A. Protectorate ...	34,810
,, ,, Uganda	25,032
Settlers and Traders	3,500
Government of Nigeria	10,080
Total ...	125,854

Anthrax. – Several cases of this disease occurred at Fort Ternan Quarantine Station amongst cattle undergoing quarantine after double inoculation for Rinderpest. The infection in many cases appeared to take place at the site of inoculation and in some cases infected animals lived for 20 days after developing symptoms. There is strong evidence to show that animals may be infected with the bacillus of Anthrax without clinical symptoms of the disease being apparent, and it has been demonstrated, that while this bacillus may be inoccuous or at least non-fatal to a number of indigenous animals, the same bacillus may prove highly fatal to others.

It is by this factor that we might assume Anthrax is carried from animal to animal in the process of double inoculation for Rinderpest. Many no doubt will miss infection, others though infected do not sicken, while others, again, contract Anthrax and die. Cases of anthrax also occurred amongst transport cattle working on the Mumias-Kisumu Road, and in the Nairobi and Kyambu Districts. As this disease is communicable to man and proves frequently fatal, animals intended for human consumption should be carefully inspected and temperatured before slaughter.

Pleuropneumonia.—A few cases of Pleuropneumonia came under notice among the stock confiscated from the Turkhana. The precautions taken prevented animals from being moved to the settled areas.

With regard to the quarantine area for this disease in the Masai Reserve every possible precaution is being taken to prevent the spread of the disease from this area, but owing to the large purchases of slaughter oxen which are being made from the Masai for Military purposes the owners of the infected herds may be tempted to evade quarantine restrictions and sell infected animals to the Military

Tuberculosis.—No cases of Tuberculosis have been reported this year.

Contagious Abortion of Cattle.—This disease has come under notice on a few farms in the Molo, Nairobi, Naivasha and Machakos Districts, but it is of such an insidious nature and usually pursues such a mild course in native cattle that it is highly probable that it will be found to be much more wide spread than is at present suspected. The disease spreads from farm to farm through infected cattle changing hands and too often unscrupulous farmers conceal the fact that their herds are infected to enable them to dispose of their stock. On the other hand, owing to the mild course it usually follows in native cattle, the disease may be present in a herd without the owner having suspected its existence.

In Europe and other countries contagious abortion is a very serious disease from the stock breeders and dairy farmers point of view, and is the cause of enormous losses to owners of infected herds.

It is probable that the disease in this country will be found to be a most serious one, should it appear in herds of grade cattle. It is therefore highly advisable that all cattle breeders should take every precaution to safeguard their herds against the disease. Rigorous preventive measures enable the disease to be effectually controlled only in herds that are well looked after, and experience in Europe and other countries, goes to prove that for the present. effective legislation cannot be devised.

The most practical method of preventing the introduction of this disease on to a farm is to submit all newly purchased breeding animals to some months quarantine on an isolated portion of the farm before they are allowed to commingle with the animals of the homestead.

In calf cows purchased should be calved down in isolated kraals and not allowed to leave these kraals until the animals have returned to normal health and all uterine discharge has ceased. Only then, after careful disinfection of the cows, should the stud bull be allowed access to them.

A pamphlet dealing with the whole subject will shortly be issued by the Department.

Trypanosomiasis.—An outbreak of Trypanosomiasis occurred in June 1915 amongst settlers cattle in the Thika District. A Veterinary survey was carried out over the whole district in July and August, when it was found that the disease was being largely disseminated through the agency of the common bloodsucking cattle fly (Stomoxys). The area implicated was placed in quarantine in September 1915, and since then a Veterinary Officer has been permanently retained in the district, carrying out periodic examinations of all cattle; destroying all animals found to be affected with the disease. The measures to date have been instrumental in reducing the incidence of the disease and there is reason to believe that the disease will be eradicated along the transport routes in the near future when it will be possible to allow freer movement of cattle in the district.

Foot and Mouth Disease.—An outbreak of this disease occurred at the Laboratory amongst cattle imported from Uganda. Prompt action was taken to segregate the affected herd, and any danger of the disease spreading to the Native Reserve was prevented, through the kindness of the officer Commanding the Nairobi Defence Force, who kindly supplied, and armed guard to patrol the infected area.

This outbreak gave the Veterinary Pathologist an opportunity to satisfy himself in regard to the virulence of the Uganda form of this disease. It proved to be of a very benign type, and local stock possess a considerable resistance to it.

Quarter Evil.—Outbreaks of Quarter Evil have been reported in Nyeri, Lumbwa, Nakuru and Kisumu Districts. A vaccine produced at the Laboratory has been used and has given good results.

DISEASES OF EQUINES.

Glanders.—Cases af Glanders have occurred in one or two consignments of remounts from South Africa. By application of the Mallein test all affected animals were promptly discovered and destroyed.

There should be little fear of this disease remaining in the country on account of the care that is being exercised to control and eradicate it.

Epizootic and Ulcerative Lymphangitis.—It is gratifying to find that very few cases of Epizootic Lymphangitis were noted during the year and there has been a great diminution in the number of Cases of Ulcerative Lymphangitis also. This decrease is mainly due to the fact that practically all the equines in the country came under Veterinary inspection during Military commandeering operations when most of the affected animals were either destroyed or sent to the Laboratory for treatment.

There are a number of equines infected with Ulcerative Lymphangitis, however, still on the Uasin Gishu Plateau.

The organism of Ulcerative Lymphangitis is present in the soil throughout the Protectorate. No good cause could be served by keeping this disease on the Schedule of notifiable diseases, and steps were taken to delete this disease from the Diseases of Animals Ordinance.

Horse Sickness.—This disease was the cause of considerable mortality among Military remounts in the Nairobi, Mbagathi and Bissel Camps.

Few cases have been reported by farmers during the year but this is probably not due to the disease being less prevalent than formerly, but because owing to the War, fewer animals are to be found on the farms.

Strangles.—Several consignments of remounts from South Africa arrived at Kilindini infected with Strangles, the disease proving

to be of an unusally virulent type. As great care is exercised to prevent any affected animals being sold at the sales of remounts there should be no risk of this disease appearing on farms.

DISEASES OF THE SHEEP AND GOAT.

The principal diseases of the sheep and goat which have come under our notice during the year in the Military flocks have been Nairobi Sheep Disease, contagious foot-rot, verminous gastro-enteritis and contagious pleuro-pneumonia of the goat.

DISEASES OF THE PIG.

Two outbreaks of suspected East African Swine Fever were reported from Nyeri and the Uasin Gishu Plateau, respectively, but these were not confirmed.

DISEASES OF THE DOG.

An outbreak of suspected Rabies was reported from South Kavirondo, but the Veterinary Department had no opportunity to confirm the diagnosis.

An outbreak was reported from Limoru, but as the suspected animals had been promptly destroyed, a diagnosis was not made.

THE PERMIT SYSTEM.

I take this opportunity of thanking the Honorary Permit Issuers for their co-operation and kind assistance during the past year.

When compulsory dipping is instituted it will be possible to considerably modify the quarantine regulations. All movement of stock, so far as East Coast Fever is concerned will be regulated under dipping rules and the differentiation of clean and infected areas will no longer be necessary.

The farmer who neglects to dip his stock will be the only person to suffer, as he will be unable to move cattle from his farm.

LIVESTOCK IMPORTATIONS.

The following animals, apart from those imported for Military purposes, were passed through the Ports of Mombasa and Kilindini during the last financial year:—

Horses	18	Sheep	15
Mules	44	Goats	313
Donkeys	55	Pigs	10
Cattle	551	Poultry	139
Camels	39	Dogs	21

MEAT INSPECTION.

The following are the Nairobi Slaughter House Returns for the past financial year:—

Slaughtered.		Condemned.	
Bullocks	4749	Bullocks	106
Sheep and Goats ...	30,965	Sheep and Goats ...	96
Pigs	337	Pigs...	Nil.

For purposes of comparison the number of animals slaughtered, during 1912-1913, 1913-14 and this year were as follows :—

	Bullocks.	Sheep and Goats.	Pigs.
1912-13	1,057	30,482	Nil
1913-14	1,567	35,957	102
1914-15	4,749	30,965	337

The large increase shown in the number of bullocks slaughtered, is accounted for by the fact, that a large number of slaughtered oxen for the Military Authorities were dealt with.

TRADING.

Through the Veterinary Station, Rumuruti, the following stock was inspected, inoculated or dipped and passed :—

Cattle	... 8,964
Sheep and Goats	... 7,812
Horses	... 80
Mules	... 435
Donkeys	... 94

The Revenue accruing from inoculation fees throughout the Protectorate amounts to Rs. 20,908.

BRANDING OF STOCK.

During the year ending March 31st, 1916, 35 new brands were registered.

GENERAL.

As the entire staff of the Veterinary Department is still carrying out Military duties as the East Africa Veterinary Corps it has been often exceedingly difficult to cope with outbreaks of disease but every endeavour has been made to do so promptly and effectively.

The Military duties of the Veterinary Corps included the purchase of all Livestock for meat supplies for the troops and the purchase and control of all remounts. Owing to the large importations of Military animals it however became essential to keep a large Veterinary staff in the field with the troops and, to do this, it was found necessary to hand over the control of the Livestock Department to the Supply Corps. This was done in November 1915 and, in February, the control of the Remount Department was passed to Lieut.-Colonel Findlay, Deputy Director of Remounts.

This enabled the Veterinary Corps to devote its energies to work of a purely Veterinary nature, and to the purchase and inoculation of Military transport oxen.

In conclusion, I would take this opportunity of expressing my high appreciation of the excellent work carried out by the members of my staff.

(Sd.) ROBERT J. STORDY,
Chief Veterinary Officer.

ANNUAL REPORT

OF THE

VETERINARY PATHOLOGIST

FOR THE

YEAR ENDING 31st MARCH, 1916

VETERINARY PATHOLOGICAL LABORATORY,
Box 323, Nairobi,
December 23rd, 1916.

THE CHIEF VETERINARY OFFICER,
NAIROBI.

SIR,

I have the honour to submit herewith my Seventh Annual Report as Veterinary Pathologist. The period covered being the financial year 1915-16.

During the year Military requirements occupied the greater portion of our time, and Research work had in great measure to be confined to diseases of urgent Military importance. Routine bench work, and the manufacture of sera and vaccine were continued as uninterruptedly as was possible, since the Staff was depleted by the resignation of one Assistant, and the transference of another to the Field Laboratory with the Forces.

In this Report I do not propose to enter into a discussion on any of the Research work accomplished, since it is anticipated that a Comprehensive Report on the Investigations of the past seven years will be shortly completed and made available for Veterinary Officers and Stockowners.

PERSONNEL.

On September 1st, 1915 all members of the Staff were incorporated in the East Africa Veterinary Corps.

The Assistant Veterinary Pathologist, Mr. W. Kearney and myself have been on duty throughout the year and at various times have visited the Veterinary Depots, Hospitals, etc., at the front, and on the lines of communication.

Clerical Staff.—Messrs. Galway, Myers and Bromhead have remained on duty throughout the year.

Lay Laboratory Staff.—Mr. Schultz was attached for duty to the Veterinary Field Travelling Laboratory on 25th March, 1916. Messrs. Gray and Ford have been in residence throughout the year. Mr. C. J. Scott resigned his appointment on 12th February.

Overseer.—Mr. J. Burton proceeded on Home leave on April 30th, 1915 and returned to duty here on November 23rd, 1915. On April 23rd, 1915, Mr. Wight was engaged temporarily to carry out the duties of this office during Mr. Burton's absence.

Yard Foreman.—On the return of Mr. Burton from leave Mr. Wight took over the duties of Yard Foreman in place of Corporal Mitchell who proceeded to the field on December 1st, 1915.

Storekeeper—Mr. J. Scott has been in residence throughout the year.

Mechanic.—Mr. J. Cairns has been on duty throughout the year.

Lab. Students.—Mr. E. Bessler was appointed as Laboratory Student on June 11th, 1915 and took up the duties of the office on August 10th, 1915.

CORRESPONDENCE.

During the year 5,986 inward and 6,079 outward letters and telegrams have been dealt with, a total of 12,065.

LABORATORY BUILDINGS AND EQUIPMENT.

I have to record that on February 23rd the Bungalow occupied by the Assistant Veterinary Pathologist was destroyed by fire. The Gas, Electric and Steam plants have been of the greatest assistance, and have run most satisfactorily.

The production of Foodstuffs from our farm has reduced the expenditure of stock feeding very considerably. With the rotation of crops and the manufacture of ensilage, a steady supply of disease free forage has been kept up. The farm buildings have also been increased to accommodate healthy stock awaiting experimentation, and breeding animals.

LIVESTOCK.

Species.	On books 31-3-15.	Received during year.	Total for year.	Remaining on books 31-3-16.
Horses ...	43	134	177	92
Mules ...	53	83	136	33
Donkeys ...	22	20	42	28
Cattle ...	417	433	850	491
Sheep ...	267	378	645	179
Goats ...	26	71	97	8
Pigs ...	28	30	58	19
Totals ...	856	1,149	2,005	850

TECHNICAL WORK OF THE YEAR.

1. Routine.

(*a*) EXAMINATIONS.—A total number of 3,681 slides and specimens received from Government Officials and Stock-owners were examined and reported on during the year.

The following is a classification of the principle positive diagnoses arrived at:—

HORSES.	Total examined	... 432
	Anthrax	... 34
	Epizootic Lymphangitis	... 24
	Ulcerative Lymphangitis	... 89
	Trypanosomiasis	... 7
	Streptothricosis	... 6
	Streptococci Equi. (Strangles)	... 6
	Biliary Fever	... 1
	Glanders	... 2
MULES.	Total examined	... 535
	Anthrax	... 13
	Epizootic Lymphangitis	... 62
	Ulcerative Lymphangitis	... 84
	Streptothricosis	... 2
	Trypanosomiasis	... 32
	Streptococcus (Strangles)	... 1
	Glanders	... 1
DONKEYS.	Total examined	... 73
	Anthrax	... 2
BOVINES.	Total examined	...2,301
	Anthrax	... 49
	Anaplasma	... 9
	Black quarter	... 36
	Colon Bacillosis	... 7
	East Coast Fever	... 505
	Trypanosomiasis	... 48
	Redwater	... 11
	Streptothricosis	... 5
	Pyelo Nephritis	... 1
SHEEP.	Total examined	... 75
GOATS.	Total examined	... 20
PIGS.	Total examined	... 22
	Swine Fever	... 1
DOGS.	Total examined	... 83
	Tick Fever	... 30
	Trypanosomiasis	... 2
CAMELS.	Total examined	... 29
	Trypanosomiasis	... 3
FOWLS.	Total examined	... 75
	Kikuyu Fowl Disease	... 14
	Tuberculosis	... 2

SERUM AND VACCINE PREPARATION.

204,480 doses of Anti Rinderpest serum were manufactured during the year. Of this total 127 290 doses were issued as under :—

Laboratory for experimental purposes		...	1,436
Government Officials ...	...	...	34,810
Private individuals ...	...	...	3,500
For Military purposes ...	...	...	42,352
To other Countries—			
(1) Nigeria ...	10,080		
(2) Uganda ...	35,112		
			45,192
			127,290

The Rinderpest Serum Suspense Account has been in operation throughout the year, and has been the means of allowing maunfacture of serum to continue on a scale sufficiently large to meet all requirements of a Military nature as well as to supply Uganda and so attempt the preservation of our western border.

Table shewing the amount of Serum and Vaccine prepared and issued during the year 1915-16.

	Prepared.	*Issued.*
Anti Rinderpest serum ..	204,480	127,290
Black Quarter vaccine ...	25,540	11,820
Colon Bacillosis vaccine ...	1,136	1,081
Ulcerative Lymphangitis vaccine ..	5,091	2,731
Canine Trypanblau ...	414	385

In conclusion I wish to express my thanks to all members of the Laboratory Staff as well as to Verternary and Adminstrative Officers for their loyal co-operation during a very difficult year.

I have the honour to be,

Sir,

Your obedient servant,

(Sd.) R. EUSTACE MONTGOMERY,

Veterinary Pathologist.